FLORA

OF THE

PRESIDENCY OF MADRAS

BY

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PART III

LEGUMINOSAE–CAESALPINIOIDEAE
CAPRIFOLIACEAE

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INTRODUCTION TO PART III.

As indicated in my Introduction to Part II, this one has had to be prepared with such material as was available in this country, chiefly the Herbaria at Kew and the British Museum and my own collections. But I have recently had, by the courtesy of the Regius Keeper, the use of the South Indian specimens in the Herbarium of the Royal Botanic Gardens, Edinburgh, among which are many of those collected by Roxburgh, Wight, Sir Walter Elliot, Dr. H. Cleghorn, Sir G. Watt and others. I have also been able to use, by the kindness of the Sherardian Professor of Botany at Oxford, the Dubois Collection made more than 200 years ago.

For the future, I am glad to say that the Madras and Calcutta and Travancore collections will again be available for the work.

I have thought it best to close this Part without breaking into the large Family of the Rubiaceae, but Parts I, II and III together will, by ending at p. 577, be still one page ahead of the proper number, 576.

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FLORA OF MADRAS

Subfamily II. CAESALPINIOIDEAE.

Trees or shrubs sometimes climbing, rarely herbs. *Leaves* pinnate or bipinnate, usually with many leaflets, sometimes reduced to 1 pair and these sometimes again more or less connate; stipels none or rarely minute. *Flowers* zygomorphic, rarely regular, hermaphrodite, various in size and colour, usually racemose, the racemes axillary, lateral or panicled at the ends of the branchlets. *Calyx* enclosing the disk; lobes usually 5 or 4 from union of the upper pair, separate to the margin of the short or elongated disk, or very rarely gamosepalous, imbricate, rarely valvate. *Petals* usually 5, rarely fewer or 0, the upper innermost in bud, the others imbricate. *Stamens* 10 or fewer by abortion, rarely numerous; filaments usually free. *Ovary* free or on a stalk which is more or less adnate to the disk. *Pod* dehiscent or indehiscent, often septate. *Seeds* various, albuminous or exalbuminous.

Tribe IX. EUCAESALPINIEAE.—Leaves all bipinnate or rarely simply pinnate; sepals free to the disk; anthers versatile:—

Flowers in racemes or panicles:—

Sepals imbricate:—

Pod not winged or rarely slightly winged; leaflets rather small .... 60. **Caesalpinia.**

Pod broadly winged along the upper suture; leaflets large
61. **Mezoneurum.**

Pod produced in a wing at the apex; leaflets small
62. **Pterolobium.**

Sepals valvate or subvalvate:—

Pod thin, flat; leaf rhachis long with many pinnae and leaflets; flowers large .... 63. **Delonix.**

Pod turgid, moniliform; leaf rhachis very short with 2–6 pinnae with many minute leaflets; flowers small. ....64. **Parkinsonia.**

Flowers in elongate racemes:—

Stamens 10; prickly climber with small leaflets and turgid subtorulose pod ....65. **Wagatea.**

Stamens 5; unarmed lofty tree with large leaflets and flat-winged pod ....66. **Acrocarpus.**

Tribe X. CASSIEAE.—Leaves simply pinnate; calyx-lobes usually free to the base:—

Petals 5; stamens 10, sometimes some reduced to staminodes; anthers usually dehiscing by a terminal pore; leaves abruptly pinnate .... 67. **Cassia.**

Petals 0; stamens 2, anthers dehiscing longitudinally; leaves imparipinnate .... 68. **Dialium.**

Tribe XI. BAUHINIEAE.—Leaves of 2 leaflets, usually joined together for a portion of their length, sometimes free; calyx gamosepalous:—

Petals unequal, erect or patent; stamens 10, sometimes reduced to 3 or even 1, the rest usually sterile .... 69. **Bauhinia.**

Tribe XII. AMHERSTIEAE.—Leaves usually abruptly pinnate; calyx-lobes free to the disk, usually imbricate; ovary 3–many-ovuled, the ovary stalk adnate to the disk:—

Petals wanting; stamens 3–9; calyx-lobes 4........ 70. **Saraca.**

Petals 3–5:—

Stamens monadelphous, only 3 developed; leaflets many 71. **Tamarindus.**

Stamens 5, free, equal, alternating with 5 staminodes 72. **Humboldtia.**

Tribe XIII. CYNOMETREAE.—Leaves abruptly pinnate, 2–many-foliolate; calyx-lobes free to the disk, imbricate or valvate; ovary 1–2 ovuled; seed 1:—

Petals wanting:—

Leaflets 1 pair; stigma large, peltate; pod samaroid below 73. **Hardwickia.**

Leaflets 4–7; stigma minute; pod thickened below 74. **Kingiodendron.**

Petals 5; leaflets 1–3 pairs; stigma capitate........ 75. **Cynometra**

60. Caesalpinia, Linn.

Trees or shrubs or climbers, armed or unarmed. *Leaves* abruptly bipinnate; pinnae abruptly pinnate; leaflets many small or fewer and larger; stipules various; stipels 0 or converted into thorns. *Flowers* often showy, yellow or red, in axillary or terminal racemes or panicles; bracts caducous; bracteoles 0. *Calyx* of 5 sepals, connate at base in a disk-lined tube; the lowest sepal concave outermost. *Petals* 5, orbicular or oblong, clawed, the uppermost smallest. *Stamens* 10, free, declinate; anthers uniform. *Ovary* sessile, few-ovuled; style filiform; stigma ter-

minal. *Pod* oblong or ovoid, thin, flattened or turgid, sometimes spiny, sometimes torulose. *Seeds* transverse, ovate to orbicular.

Pod covered with wiry prickles, oblong, inflated; petals narrow; seeds 1–3, hard, globose, grey :—

Leaves with large foliaceous pinnate stipules; leaflets elliptic-oblong, obtuse, mucronate, 1–2 in. long, bracts lanceolate, acuminate, ·5 in. long; pods 2–3·5 in. long, 1·5–2 in. broad......1. *crista.*

Leaves without stipules; leaflets elliptic-oblong, acute, 2–3 in. long; bracts subulate, ·25 in. long; pods 4–5 in. long, 2 in. broad 2. *Jayabo.*

Pod with minute bristles, obovoid-falcate, turgid, shortly beaked, 1·5–2 in. long, ·7 in. broad, 2-seeded; stems leaf-rhachises and pedicels densely prickly; leaves with many short pinnae each with 10–20 pairs of small leaflets; racemes 1–2·5 ft. long .. .. 3. *mimosoides.*

Pod without prickles or bristles, usually glabrous :—

Pod flattened, not twisted or torulose :—

Pod obliquely ovoid, beaked, 2–2·5 in. long, 1·25 in. broad, 1-seeded; stems recurved prickly; pinnae 3–4 pairs, leaflets 2–3 pairs, ovate, acute, up to 2 in. long, 1 in. broad; flowers in panicles of racemes....... .... 4. *Nuga.*

Pod obliquely-oblong, truncate at apex and prominently beaked on the upper suture, 3–4 in. long, 1·5 in. broad, 3–4-seeded; stem with few prickles; pinnae 8–12 pairs, leaflets 10–18 pairs, oblong-falcate; 5 in. long; flowers in panicles of racemes .... ..*Sappan.*

Pod oblong, sometimes slightly winged on the upper suture, prominently beaked 3–4 in. long, 1 in. broad, 6–8-seeded; stems etc., with many recurved thorns; pinnae 5–10 pairs, leaflets 8–12 pairs, ·5–·7 in. long; flowers in racemes with long pedicels 5. *sepiaria.*

Pod oblong, straight, thin, 2–3 in. long, ·7 in. broad, shortly beaked; stems nearly unarmed, erect; pinnae 6–8 pairs, leaflets about 10, obovate, ·5–·7 in. long; flowers in subcorymbose racemes. *pulcherrima.*

Pod torulose, thick, oblong, with a short recurved beak, 1·5–2 in. long, ·7 in. broad, 2–4-seeded; prickles few; pinnae about 10 pairs, leaflets 8–10 pairs, ·3–·4 in. long; flowers in racemes . .. 6. *digyna.*

Pod twisted, thin; stems unarmed; pinnae 7–8 pairs, leaflets 25–30, very narrow, ·25 in. long; flowers small, in short dense panicles...... ....*Coriaria.*

1. Caesalpinia crista, Linn. *C. Bonducella*, Flem.; F. B. I. ii. 254. *Guilandina Bonduc.*; W. & A. 280 *in part* var. *minor*, DC.

In most Plains Districts, in hedges and on waste lands near villages, especially near the coast.

A large straggling very thorny shrub with yellow flowers. The hard grey seeds are used in medicine to give a bitter tonic. Vern. *Hind.* Kat karanj.; *Tel.* Getsakeia; *Tam.* Kalichikai.

2. Caesalpinia Jayabo, Maza; Merr. in Interp. Herb. Amb. 261. *C. Bonduc,* Baker in F. B. I. ii. 255. *Guilandina Bonduc.*, W. & A. 280 *in part* var. *major*, DC.

Carnatic, near the coast (?) (G. Thomson).

A large straggling shrub with yellow flowers and larger leaflets than the last.

3. Caesalpinia mimosoides, Lamk.; F. B. I. ii. 256; W. & A. 281; Wt. Ic. t. 392.

W. Coast and W. Ghâts at low levels and up to 4,000 ft.

A very prickly climbing shrub with bright yellow flowers.

4. Caesalpinia Nuga, Ait.; F. B. I. ii. 255. *C. paniculata,* Roxb.; W. & A. 281; Wt. Ic. t. 36.

W. Coast, on river banks.

A large climbing shrub with yellow fragrant flowers.

5. Caesalpinia sepiaria, Roxb.; F. B. I. ii. 256; W. & A. 282; Wt. Ic. t. 37.

Circars, Deccan and Carnatic in hedges and open bushy places; W. Ghâts, up to 6,000 ft. The Mysore Thorn.

A large straggling thorny shrub with bright yellow flowers, usually very pubescent, but sometimes in the Deccan nearly glabrous as in N. India. Vern. *Hind.* Aila; *Ur.* Gilo; *Mar.* Chillari.

6. Caesalpinia digyna, Rottl.; F. B. I. ii. 256; W. & A. 281.

N. Circars, from Ganjam to Godavari, chiefly near villages.

A prickly climbing shrub, with yellow flowers, the upper petal streaked with red. The seeds give an oil and the pods are said to give a very valuable tanning material.

Caesalpinia Sappan, Linn., is the Sappan Wood, a tree with an orange-red hard heartwood, which besides being useful in turnery gives a red dye. It is only found in cultivation. *C. pulcherrina,* Swartz, is an erect shrub with yellow or scarlet flowers with long stamens, very common in gardens. *C. Coriaria,* Willd., the "Divi-divi," is a small branching South American tree, cultivated for its pods, which are a valuable tanning material.

61. Mezoneurum, Desf.

Prickly woody climbing shrubs. *Leaves* abruptly bipinnate; pinnae abruptly pinnate; leaflets small and numerous or large and few; stipules small or 0; stipels 0. *Flowers* in axillary or terminal panicles of racemes; bracts narrow, usually deciduous; bracteoles 0. *Calyx* very oblique, the tube short; lobes imbricate; the lowest longest and hood-like. *Petals* 5, 4 orbicular, spreading, subequal, the uppermost different. *Stamens* 10, free, exserted; anthers uniform. *Ovary* sessile or shortly stalked, 2–many-ovuled; style filiform; stigma small, capitate. *Pod* oblong, flat, thin, indehiscent, broadly winged along the upper suture. *Seeds* transverse, compressed, orbicular or reniform.

MEZONEURUM CUCULLATUM, W. & A. 283; F. B. I. ii. 258; var. *grandis*, Baker in F. B. I. ii. 258.

Malabar and Travancore, in forests up to 2,000 ft.

A large climbing shrub, the stems with conical corky protuberances bearing a pair of hooked thorns; the upper petal short and wide, 2-lobed; the leaflets 3–4 in. long.

62. Pterolobium, R. Br.

Trees or climbing shrubs, armed with recurved thorns. *Leaves* bipinnate, the leaflets small; stipules and stipels small, caducous. *Flowers* small, in axillary or terminal racemes, long-pedicellate; bracts subulate, caducous; bracteoles 0. *Calyx*-tube short, cup-shaped, persistent; lobes 5, imbricate, the lowest longest. *Petals* 5, unequal, clawed, as long as the calyx-lobes. *Stamens* 10, free, the filaments villous; anthers uniform. *Ovary* sessile, 1-ovuled; style subulate; stigma terminal, dilated. *Pod* indehiscent; samaroid, 1-seeded, ending in an oblong or falcate wing. *Seed* large, compressed.

PTEROLOBIUM INDICUM, A. Rich.; F. B. I. ii. 259. *P. lacerans*, Wall.; W. & A. 283; Wt. Ic. t. 196.

All dry forest Districts from the Godavari southwards to the lower Pulneys. Common in open places over bushes and small trees.

A very thorny straggling or climbing shrub with yellow flowers and reddish winged pod. Vern. *Tel.* Walekaduda.

63. Delonix, Raf.

Erect unarmed trees. *Leaves* abruptly bipinnate; leaflets many, small; stipules small; stipels 0. *Flowers* large, showy, in terminal corymbs; bracts small, caducous; bracteoles 0. *Calyx*-tube very short; lobes 5, valvate, subequal. *Petals* 5. orbicular, imbricate, clawed, subequal or the uppermost dissimilar; margins fimbriate. *Stamens* 10, free, declinate, long-exserted; filaments villous below; anthers uniform. *Ovary* subsessile, many-ovuled; style filiform; stigma truncate, ciliolate. *Pod* elongate, flat, woody, dehiscent. *Seeds* transverse, oblong.

Petals yellowish-white, turning orange; leaflets ·5 in. long; pod 6–8 in. long, 1 in. broad..1. *elata.*
Petals crimson, the claws yellow, the upper petal white streaked with red and yellow; leaflets ·25 in. long; pod up to 2·5 ft. long, 2 in. broad.. *regia.*

DELONIX ELATA, Gamble n. comb. *Poinciana elata*, Linn.; F. B. I. ii. 260; W. & A. 282; Bedd. Fl. t. 178.

Planted as an avenue tree and run wild; rare, but found in forests on both sides of the Peninsula according to Roxburgh, Brandis and Beddome, but this is very doubtful.

A pretty medium-sized tree with a yellowish-white wood. The branches and leaves are cut for leaf-manure. Vern. *Tel.* Sankesula; *Tam.* Padenarayan.

Delonix regia, Raf., the Gul Mohr or Flamboyant tree is an introduction, said to come from Madagascar, and is planted in gardens and avenues for ornament and for the shade given by its rounded head, bright green leaves and magnificent trusses of crimson flowers. The wood is soft and white, of no value.

64. Parkinsonia, Linn.

Small armed trees. *Leaves* bipinnate with a very short main rhachis; pinnae long, with flattened rhachis bearing many very small leaflets; stipules spinescent, straight; stipels 0. *Flowers* in short lax axillary racemes, pedicels long; bracts small, caducous; bracteoles 0. *Calyx*-tube short, disk-lined; lobes membranous, slightly unequal, subvalvate. *Petals* 5, spreading, with short broad claws, that of the uppermost longer. *Stamens* 10, free; filaments villous; anthers uniform. *Ovary* shortly stalked, many-ovuled; style filiform; stigma small, terminal.

Pod linear, torulose, turgid at the seeds, finally dehiscent. *Seeds* oblong, elongate.

PARKINSONIA ACULEATA, Linn.; F. B. I. ii. 260; W. & A. 284.

In all dry Districts, a native of Tropical America, run wild, often on black cotton soil.

A small tree or shrub with showy yellow flowers and narrow pods, the very small leaflets often early deciduous. Vern. *Teb.* Sinia tumana.

65. Wagatea, Dalz.

A climbing shrub with scattered prickles. *Leaves* abruptly bipinnate, pinnae 4–6 pair, leaflets 6–7 pair, oblong; stipules small. *Flowers* subsessile in long simple or panicled spicate racemes; bracts minute. *Calyx*-tube campanulate; lobes 5, subvalvate, the lowest rather the largest. *Petals* 5, subequal, erect, oblong, obtuse, imbricate. *Stamens* 10, free; filaments pilose at the base; anthers uniform, alternate ones shorter. *Ovary* subsessile, free, many-ovuled; style slightly clavate; stigma oblique. *Pod* oblong, indehiscent, subtorulose, turgid at the seeds. *Seeds* ovoid.

WAGATEA SPICATA, Dalz.; F. B. I. ii. 261; Wt. Ic. t. 1995.

W. Gháts, in S. Canara, Mysore and Malabar, up to 3,000 ft.

A prickly climber with scarlet calyx and orange petals.

66. Acrocarpus, Wt.

An erect unarmed tree. *Leaves* bipinnate, pinnae 3–5 pairs, each with 5–6 pairs of large leaflets, paripinnate; stipules deciduous; stipels 0. *Flowers* in dense axillary racemes, usually deflexed, pedicels short; bracts small, caducous, like the small lanceolate bracteoles. *Calyx*-tube campanulate, disk-lined, lobes 5, lanceolate, equal, as long as tube. *Petals* 5, narrow, subequal. *Stamens* 5, free, exserted, anthers versatile. *Ovary* stipitate, many-ovuled; style short, incurved; stigma minute. *Pod* flat, ligulate, dehiscent, the upper suture winged, 5–10-seeded. *Seeds* obovate, oblique, compressed.

ACROCARPUS FRAXINIFOLIUS, Wt. Ic. t. 254, *excl. leaf*; F. B. I. ii. 292; Bedd. Fl. t. 44.

W. Gháts, in the Nilgiri, Anamalai, Travancore and Tinnevelly hills, in evergreen forest up to 4,000 ft.; often planted.

A very large and lofty deciduous tree with large buttresses,

the flowers green with crimson stamens, the leaflets elliptic-lanceolate, 3–4 in. long, bright red when young. Bark light grey; wood light red, useful for building and furniture. Vern. *Tam.* Malam konné; *Mal.* Kurangan.

67. Cassia, Linn.

Trees, shrubs or herbs. *Leaves* abruptly pinnate, the rhachis often furnished with glands between the leaflets or on the petiole below them; stipules various; stipels 0. *Flowers* usually yellow, often large and showy, in axillary racemes, terminal panicles or supra-axillary fascicles of 1 or more; bracts and bracteoles present, various. *Calyx*-tube very short; lobes 5, imbricate. *Petals* 5, imbricate, subequal or the lower the largest. *Stamens* normally 10 but rarely all perfect and equal, 3–5 usually the uppermost, being sometimes wanting or reduced to staminodes; anthers of the 3 lowest stamens often the longest, all dehiscing by terminal pores or by a short slit. *Ovary* sessile or stalked, many-ovuled; style incurved; stigma terminal, usually truncate, sometimes ciliolate. *Pod* variable, dehiscent or indehiscent, terete or flat, usually septate between the seeds. *Seeds* transverse, rarely longitudinal, usually compressed, albuminous.

Sepals broad, obtuse :—
- Stamens all antheriferous, but the 2–3 lowest larger than the others and with longer filaments; pods long, terete, indehiscent, cylindrical, transversely septate :—
  - Leaflets 4–8 pairs, ovate, acute, 2–6 in. long; petals yellow; pod 1–2 ft. long .... 1. *Fistula.*
  - Leaflets 10–20 pairs, oblong, obtuse, 1–2 in. long; petals rose-coloured; pod under 6 in. long .... 2. *marginata.*
- Stamens with 6–7 antheriferous, the rest reduced to staminodes pods usually dehiscent, transversely septate :—
  - Leaves with 1 gland just above the base of the petiole, none between the leaflets :—
    - Leaves almost glabrous; pods compressed, torulose, the margins thickened :—
      - Leaflets 3–5 pairs, ovate, acuminate, 1–3 in. long; pods flat 3. *occidentalis.*
      - Leaflets 5–10 pairs, oblong-lanceolate, about 1 in. long; pods more or less turgid .... 4. *Sophera.*
    - Leaves and pods hirsute; leaflets about 4 pairs, lanceolate, 2–4 in. long; pods slender, flattened .... 5. *hirsuta.*

Leaves with subulate glands between the leaflets, none on the petiole base; stipules narrow, caducous:

Leaflets 3 pairs, obovate, obtuse; flowers small, in axillary pairs; pods slender, subtetragonous; annual herbs......6. *Tora.*

Leaflets 3–5 pairs, lanceolate or oblong-lanceolate, acuminate, glabrous; flowers in subterminal corymbs, large; pods cylindric, turgid, up to 3 in. long ....7. *laevigata.*

Leaflets 6–8 pairs, oblong, obtuse, densely tomentose beneath; flowers in subterminal corymbose racemes, large; pods flattened, up to 5 in. long, pubescent .. .. 8. *tomentosa.*

Leaves with subulate glands between all the 8–12 pairs of elliptic-obtuse leaflets, and a pair of large obliquely cordate stipules at their bases; flowers in subterminal but axillary corymbs, large; pods flat, papery, obtuse at each end, stalked, 4–5 in. long, ·7 in. broad........ ....9. *auriculata.*

Leaves without glands on the petiole or between the leaflets:—

Pods more than 3 in. long:—

Stipules minute, caducous; racemes corymbose, forming a long terminal panicle:—

Pods 3–5 in long, ·5 in. broad, flat, long-apiculate, the sutures thin, with straight transverse ridges when dry; leaflets 10–16 pairs, oblong, 1–1·25 in. long, long-mucronate 10. *montana.*

Pods 6–9 in. long, ·5 in. broad, the apicule deciduous, the sutures thickened, indented between the seeds, leaflets 8–14 pairs, oblong, emarginate, 1·5–3 in. long, shortly mucronate ....11. *siamea.*

Stipules broad, persistent:—

Flowers in axillary corymbose racemes forming a terminal panicle; leaflets 10–20 pairs, oblong, obtuse, mucronate, pubescent, 1–1·5 in. long; pods flat, thin, with their sutures 5–7 in. long, ·5 in. broad, transversely ridged 12. *timoriensis.*

Flowers in long-peduncled racemes with broad bracts; leaflets 5–12 pairs, oblong, large, 2–6 in. long, up to 3 in. broad; pods membranous, dehiscent, winged at the middle of each valve .... *alata.*

Pods less than 3 in. long, oblong, thin, papery, rounded at both ends, curved:—

Pods 1–1·5 in. long, ·5 in. broad, much curved, crested on the valves opposite the seeds; racemes short with small flowers; leaves with 4–6 pairs of obovate-oblong obtuse leaflets ....13. *obtusa.*

Pods 1·5–2 in. long, ·6–·7 in. broad, slightly curved, not crested; racemes long with large flowers; leaves with 5–8 pairs of lanceolate acute leaflets ....*angustifolia.*

Stamens 10, all equal, the two lowest with longer filaments; leaflets 4–6 pairs, ovate, acute or obtuse, glaucous; 1·5–4 in. long, 1–1·5 in. broad, usually with glands on the rhachis between the leaflets; pods straight, flat, thin, transversely barred, 6–8 in. long, ·5–·7 in. broad, stalked ....14. *glauca.*

Sepals narrow, usually acute, pod small, ligulate, dehiscent; fertile stamens 5 or 10:—

Leaflets 2 pairs, ovate, membranous, oblique, about 1 in. long; flowers axillary; fertile stamens 5, equal; pod 1–2 in. long by ·25 in. broad, ligulate, viscous, glandular like the stems and branches ....15. *Absus.*

Leaflets very many, small, narrow, with a gland on the petiole below them; stipules conspicuous; flowers supra-axillary:—

Gland on the petiole stipitate, peltate; midrib close to the upper margin of the leaflet:—

Stamens 5, fertile, staminodes 0; leaflets 20–40 pairs, usually very crispate-villous; flowers very small, solitary...16. *pumila.*

Stamens 10, alternately long and short; leaflets 10–20 pairs, usually glabrous, the rhachis crispate-villous; flowers rather large, 1–3 together in a large bract ....17. *Kleinii.*

Gland on the petiole sessile:—

Midrib nearer the upper than the lower margin of the subfalcate leaflet:—

Leaves usually 3–4 in. long, less at base and in young plants; leaflets 40–60 pairs; stamens 10, alternately long and short, narrow; pod 1–2 in. long, 16–25-seeded.........18. *mimosoides.*

Leaves usually only 1–2 in. long, leaflets 16–24 pairs; stamens sometimes 10, usually 1–3 wanting or reduced to staminodes, broad at top; pod 1–2 in. long, 8–16-seeded

19. *Leschenaultiana.*

Midrib nearly central on the oblong leaflet; leaves 2–3 in. long with about 15 pairs of mucronate leaflets ·6 in. long by ·1–·15 in. broad; stamens 10, all perfect or 1–3 reduced; pods 1–1·5 in. long, appressed-pubescent, about 10-seeded.........20. *nigricans.*

1. CASSIA FISTULA, Linn.; F. B. I. ii. 261; W. & A. 285. *C. rhombifolia* Roxb.; Wt. Ic. t. 269.

Deciduous forests in all Districts, frequently planted in gardens and avenues. The Indian Laburnum.

A moderate-sized tree with pale smooth bark when young, darker and rough when old, at once recognised by its long racemes of bright yellow flowers and long cylindrical pod. The wood is very hard, reddish-brown, strong and durable. especially useful for agricultural work. Vern. *Hind.* Amaltas; *Ur.* Sunari; *Tel.* Rela; *Tam.* Konnei; *Mal.* Konna; *Kan.* Kakke.

2. CASSIA MARGINATA, Roxb.; F. B. I. ii. 262. *C. Roxburghii*, DC.; W. & A. 286; Wt. Ill. t. 83; Bedd. Fl. t. 180.

Carnatic, in forests from S. Arcot to Travancore, elsewhere often planted for ornament.

A small deciduous tree with brown bark, short axillary racemes of rose-coloured flowers and a pod like that of the first, only shorter and more torulose. Vern. *Tam.* Vakai; *Mal.* Kada konna.

3. CASSIA OCCIDENTALIS, Linn.; F. B. I. ii. 262; W. & A. 290.

All plains Districts, by roadsides and on waste lands, perhaps introduced from W. Indies.

A diffuse undershrub with yellow flowers. Vern. *Hind.* Kasondi; *Tel.* Cashanda; *Tam.* Payaverai.

4. CASSIA SOPHERA, Linn.; F. B. I. ii. 262; W. & A. 287.

All plains Districts, by roadsides and on waste lands.

A diffuse undershrub with yellow flowers. Vern. *Hind.* Kasondi; *Tel.* Pydi-tangedu; *Tam.* Ponaveri.

5. CASSIA HIRSUTA, Linn.; Prain in Journ. As. Soc. Beng. lxvi. 2. 474.

Deccan, in the Babubudan Hills of Mysore, 4,000 ft. (Talbot); Ramandrug, Bellary (Lushington), also in the Carnatic near Madras; an introduction from America now run wild.

A diffuse undershrub with flowers in pairs in the leaf-axils.

6. CASSIA TORA, Linn.; F. B. I. ii. 263 *in part*; W. & A. 290 *in part*.

All plains Districts, on waysides, waste places, fallow lands and in forest undergrowth, also in the hills at low elevations, up to 4,000 ft.

An annual weed, almost an undershrub, with small yellow flowers and very long curved pods with rhombohedral seeds which give a blue dye. Vern. *Hind.* Chakunda; *Tel.* Tantipu; *Tam.* Tagerai.

7. CASSIA LAEVIGATA, Willd.; Prain in Journ. As. Soc. Beng. lxvi. 2.476.

   Nilgiri and Pulney Hills at 4,000–6,000 ft., introduced from tropical *America* and now run wild.

   A conspicuous shrub with large yellow flowers.

8. CASSIA TOMENTOSA, Willd.; F. B. I. ii. 263; W. & A. 286.

   Nilgiri and Pulney Hills, above 6,000 ft., introduced from tropical America and now run wild.

   A conspicuous shrub with large yellow flowers.

9. CASSIA AURICULATA, Linn.; F. B. I. ii. 263; W. & A. 290; Trim. Fl. Ceyl. t. xxxiii.

   Circars from Chicacole southwards, but not common; Deccan and Carnatic, in most Districts on dry stony hills and on black cotton soil, often gregarious.

   A beautiful shrub with large bright yellow flowers. The bark gives a valuable tanning material, the collection of it forming an important forest industry. Vern. *Hind.* Tarwar; *Tel.* Tangedu; *Tam.* Avaram.

10. CASSIA MONTANA, Heyne; F. B. I. ii. 264; W. & A. 289.

    Deccan and Carnatic, on dry stony hills and up to 3,000 ft.

    A handsome shrub with yellow flowers. Vern. *Tel.* Pagadi tangedu, Konda tangedu.

11. CASSIA SIAMEA, Lamk.; F. B. I. ii. 264. *C. florida,* Vahl; W. & A. 288; Bedd. Fl. t. 179.

    Carnatic, from the Shevaroy Hills southwards—common in forests (Beddome). Much planted in avenues, etc., and now naturalized.

    A moderate-sized tree with yellow flowers in bracteate corymbs forming a large terminal panicle. Bark grey; wood dark brown to nearly black, hard and durable. Vern. *Tam.* Manja Konnei.

12. CASSIA TIMORIENSIS, DC.; F. B. I. ii. 265.

    W. Gháts, on the Carcoor Ghát (Lawson) up to about 3,000 ft., low country of Travancore (Bourdillon).

    A small tree or large shrub with pubescent leaflets and calyx, flowers yellow.

13. CASSIA OBTUSA, Roxb.; W. & A. 288; Wt. Ic. t. 757. *C. obovata,* Collad.; F. B. I. ii. 264.

    Deccan and Carnatic, in dry places on open lands and pastures.

A diffuse perennial herb with pale yellow flowers. The leaves are sometimes used as a substitute for senna.

14. Cassia glauca, Lamk.; F. B. I. ii. 265; W. & A. 289.
W. Gháts, scarce as a wild plant, commonly planted in gardens.
A handsome shrub or small tree with pale yellow flowers and reflexed bracts.
Var. *suffruticosa*, Prain. *C. suffruticosa*, W. & A. 289.
Circars, Deccan and Carnatic, chiefly on E. side.
A shrub with smaller leaflets, flowers and pod, the leaflets more numerous.

15. Cassia Absus, Linn.; F. B. I. ii. 265; W. & A. 291.
All dry Districts, on waste lands and in open forest.
A viscous annual or biennial with very small reddish-yellow flowers.

16. Cassia pumila, Lamk.; F. B. I. ii. 266; W. & A. 292.
Deccan and Carnatic, in pasture lands.
A small diffuse or procumbent undershrub with small yellow flowers on very short pedicels.

17. Cassia Kleinii, W. & A. 293; F. B. I. ii. 266.
Deccan, in Cuddapah; W. Coast in S. Canara, Malabar and Travancore, scarce.
A diffuse undershrub with rather large yellow flowers, usually with long pedicels.

18. Cassia mimosoides, Linn.; F. B. I. ii. 266. *C. angustissima*, Lamk.; W. & A. 292.
N. Circars, hills of Gumsúr; Deccan, in hills as Horsley Konda and Ramandrug, up to 4,000 ft.; W. Gháts, in Malabar, Nilgiris, Anamalais and Travancore Hills, up to 6,000 ft.
A diffuse undershrub with long slender branches and yellow flowers.

19. Cassia Leschenaultiana, DC.; Prain in Journ. As. Soc. Beng. lxvi. ii. 477. *C. Wallichiana*, DC.; W. & A. 292. *C. mimosoides* var. *Wallichiana*, Baker in F. B. I. ii. 266.
W. Gháts, in the Nilgiri, Anamalai and Pulney Hills up to 6,000 ft., in grass lands; Deccan, in the hills of Mysore.
A suberect undershrub with yellow flowers.

20. Cassia nigricans, Vahl; Prain in Journ. As. Soc. Beng. lxvi. ii. 477

W. Coast, in S. Canara (Hohenacker); Carnatic, near Tuticorin in Tinnevelly (Wight), a coast species apparently. A shrub or undershrub with yellowish-red flowers, 2–5 together on rather stout pedicels some distance above the leaves.

Cassia alata, Linn., is a handsome shrub or small tree which has been introduced probably from the W. Indies, and is cultivated in gardens and possibly sometimes found run wild. *C. angustifolia*, Vahl; F. B. I. ii. 264 (*C. lanceolata*, W. & A. 288) is the Tinnevelly senna cultivated in S. India for its leaves, which afford a purgative drug. *C. grandis*, Linn. f., is a large tree sometimes cultivated for ornament and in avenues.

68. **Dialium**, Linn.

Trees. *Leaves* imparipinnate, leaflets subopposite or alternate; stipules small; stipels 0, *Flowers* small, in axillary or terminal panicles of small cymules; bracts and bracteoles small, caducous. *Calyx*-tube very short; lobes 5, petaloid, imbricate. *Petals* small or 0. *Stamens* 2, rarely 3, free, with short filaments; anthers erect, oblong, longitudinally dehiscent. *Ovary* sessile, 2-ovuled; style subulate; stigma small, terminal. *Pod* ovoid-globose, indehiscent, 1-seeded; exocarp hard or fragile; endocarp usually pulpy. *Seed* 1, more or less compressed, albuminous; cotyledons flat.

DIALIUM TRAVANCORICUM, Bourd. in Ind. For. xxx. 243 with fig.

W. Ghâts, in the forests of S. Travancore near Ponmudi at 1,000–2,000 ft.

A very large evergreen tree with globose pods and leaves with 7–11 caudate-acuminate leaflets 2–3 in. long by about 1 in. broad. The bark is pale brown and smooth and the wood brownish-grey with darker lines, likely to be useful. Vern. *Mal.* Malam puli.

69. **Bauhinia**, Linn.

Trees or shrubs, erect or climbing, the latter often with circinate tendrils. *Leaves* of 2 leaflets, free or more usually adnate into one entire leaf more or less deeply cleft at the apex and palmately ribbed; stipules usually small, caducous. *Flowers* more or less zygomorphic, in terminal or rarely axillary racemes

or in spreading or corymbose terminal panicles; bracts and bracteoles present, small, often caducous. *Calyx*-tube cylindric or turbinate, lined by the disk; limb entire and spathaceous with 5 teeth or cleft into lobes. *Petals* 5, slightly unequal, erect or spreading, imbricate, usually clawed, the upper petal innermost. *Stamens* 10 or reduced to 5 or 3 or even 1 fertile, the rest sterile or wanting; filaments free, filiform; anthers versatile, dehiscing longitudinally. *Ovary* stalked, many-ovuled; style short or filiform; stigma small or large and peltate, subterminal or oblique. *Pod* linear or oblong, flattened, continuous within or rarely septate, dehiscent or indehiscent. *Seeds* orbicular or ovate, compressed, albuminous.

Fertile stamens 10:—
- Calyx spathaceous, 5-toothed at apex, the tube short; trees or shrubs:—
  - Pod dehiscent, thin, ·5–·7 in. broad; flowers large:—
    - Flowers yellow, the standard with a red blotch; calyx-limb ovate, ·5 in. long; leaflets 1–2 in. long, rounded at apex, connate for about half their length; pod 4–5 in. long, not ridged along the upper suture................1. *tomentosa.*
    - Flowers white; calyx-limb long acuminate, 1–1·5 in. long; leaflets 3–6 in. long, acute at apex, connate for nearly two-thirds with a mucro; pod 4–5 in. long, ridged on each side along the upper suture..........................*acuminata.*
  - Pod indehiscent, thick, falcate; flowers in lax racemes, small:—
    - Leaflets connate for two-thirds of their length, 1–2 in. long, rounded at apex; filaments ·25 in. long, slender; pod 6–12 in. long, ·7–1 in. broad.............................2. *racemosa.*
    - Leaflets free or very shortly connate, under ·75 in. long, rounded at apex; filaments ·5 in. long, thick; pod 3–4 in. long, ·4 in. broad, twisted..................................*rufescens.*
- Calyx-tube long, thin, pubescent, with 5 short lobes; tree with coriaceous, suborbicular, semicordate leaflets, glaucous beneath, connate for three-fourths of length or even more; flowers small in axillary corymbs; pod nearly straight, flattened, reticulate, beaked, 12–18 in. long, ·75–1 in. broad ....3. *malabarica.*
- Calyx-tube very long, leathery, as are the 5 narrow lobes, 1–1·5 in. long; climbing shrub with tendrils and free, rounded, ovate, semicordate leaflets 2–3-in. long; flowers large, in lax axillary racemes, the petals narrow, the anthers very long; pod very large, flat *diphylla.*

Fertile stamens 3, sometimes 4 or 5:—

Trees:—

Flowers small, in large terminal panicles, the petals yellow with purple streaks; leaflets connate almost to the apex, coriaceous, 4–6 in. long; pods 5–6 in. long, 1·5 in. broad, flattened, gradually widening to an obtuse tip .... 4. *retusa.*

Flowers large, the petals purple-pink or white; pod 6 in.–1 ft. long, ·75–1 in. broad, flat:—

Flowers white or pink, the uppermost petal darker and variegated, usually appearing before the leaves; leaflets ovate, rounded at apex, connate for about two-thirds up 5. *variegata.*

Flowers purple or rose, petals all similar, appearing with the leaves; leaflets oblong, obtuse or subacute at apex, connate about half way up and sometimes overlapping......6. *purpurea.*

Climbers:—

Flowers rather large, in corymbose racemes:—

Fertile stamens 3; branchlets, leaves beneath, conspicuous tendrils and corymbs densely tawny villous; leaflets often very large, up to 18 in. long, connate for two-thirds up or higher; pod large, velvety, 9–18 in. long by 2–3 in. broad, the seeds flat ....7. *Vahlii.*

Fertile stamens 4–5; no tendrils; branchlets, leaves beneath, and corymbs finely ferruginous pubescent; leaflets oblong, connate for about three-fourths up, about 5 in. long; pod flat, up to 6 in. long by 1 in. broad, slightly pubescent, ridged along the upper suture .... 8. *phoenicea.*

Flowers very small, in panicles of cylindric racemes; fertile stamens 3; glabrous, with many tendrils; leaflets small, when young long caudate-acuminate, when older joined in a nearly entire cordate leaf; pod thin, flat, oblong, 1·5–2 in. long 9. *anguina.*

Fertile stamen 1; calyx-limb spathaceous; leaflets ovate, semi-cordate, subacute at apex, up to 8 in. long, connate for nearly three-fourths up; pod flat, narrow, long-beaked.............*monandra.*

1. Bauhinia tomentosa, Linn.; F. B. I. ii. 275; W. & A. 295. Circars and Carnatic, in dry forests from the Chilka Lake to Tinnevelly, especially in Kistna and Guntúr Districts, often planted for ornament.

A shrub with pretty flowers and a tough, nearly black wood. Vern. *Hind.* Kachnar; *Tam., Tel.* Kanchini.

2. Bauhinia racemosa, Lamk.; F. B. I. ii. 276; W. & A. 295; Bedd. Fl. t. 182.

Circars, Deccan and Carnatic in dry deciduous forests; W. Gháts, on dry slopes and up to 4,000 ft.

A small deciduous rather crooked tree with pale yellow flowers. Bark rough, nearly black; wood brown, hard, a good fuel. The inner bark gives a good fibre for rough ropes. Vern. *Hind.* Guriál; *Ur.* Ambhota; *Tel.* Are; *Tam.* Archi, Atti.

3. BAUHINIA MALABARICA, Roxb.; F. B. I. ii. 277; W. & A. 294.

N. Circars, in the Gumsur Sal forests and in the Godavari forests; W. Gháts, in deciduous forests, from S. Canara to Travancore, up to 2,000 ft.

A moderate-sized deciduous tree with cream-coloured flowers. Bark brown, rough; wood reddish-brown, with darker patches, moderately hard, but of little value. The leaves are acid. Vern. *Hind.* Amlosa; *Tel.* Puli shinta; *Kan.* Cheppura.

4. BAUHINIA RETUSA, Ham.; F. B. I. ii. 279.

N. Circars, on the slopes of the E. Gháts, in forest, scarce; Deccan, in Mysore, but rare.

A moderate-sized deciduous tree. Bark dark brown; wood red with darker patches and streaks, hard and of good quality. It gives a clear gum-like gum arabic, but less soluble in water. Vern. *Hind.* Semla; *Tel.* Nirpa.

5. BAUHINIA VARIEGATA, Linn.; F. B. I. ii. 284; W. & A. 296.

N. Circars, Deccan and Carnatic, in dry deciduous forest, especially on rocky hills; often cultivated for its beautiful appearance in flower.

A moderate-sized deciduous tree. Bark grey, with vertical cracks; wood greyish-brown with irregular darker patches, moderately hard. Vern. *Hind.* Kachnar; *Ur.* Borara; *Tam.* Segapu-manchori; *Tel.* Mandari.

6. BAUHINIA PURPUREA, Linn.; F. B. I. ii. 284; W. & A. 296.

N. Circars, Deccan and Carnatic, in deciduous forest, chiefly along water-courses; W. Coast, in dry forest lands; often cultivated in gardens.

A moderate-sized evergreen tree, often bushy, with rather large leaves. Bark grey to brown; wood dark brown, moderately hard, used for implements. Vern. *Hind.* Khairwal; *Tel.* Kanchanam; *Tam.* Mandari.

7. BAUHINIA VAHLII, W. & A. 297; F. B. I. ii. 279.

N. Circars, in forests down to the Godavari.

A gigantic climber with very thick stem and long branches bearing cream-coloured flowers with shortly-clawed petals. It is destructive to forest trees and has to be cut. The leaves are used as plates and for many other purposes; the seeds are roasted and eaten. Vern. *Hind.* Maljan; *Ur.* Shiali; *Tel.* Adda.

8. BAUHINIA PHOENICEA, Heyne; F. B. I. ii. 283; W. & A. 296. *B. Benthami*, Bedd. Ic. t. 107.

W. Gháts, from Coorg and Mysore to the Anamalais and Travancore, in evergreen forests.

A very large climber with brick-red flowers, the petals with long slender claws, the anthers long. It is very destructive to forest trees and has to be cut.

9. BAUHINIA ANGUINA, Roxb. Cor. Pl. t. 285; F. B. I. ii. 284 W. & A. 298.

Malabar and Travancore, near the coast, apparently scarce. Snake climber.

A large very long climber with curious stems alternately twisted one way and the other between the straight margins. *Vern.* Naga-mu-valli (Rheede).

Bauhinia acuminata, Linn., is a pretty shrub often found in gardens in the plains. I have seen no specimens from wild plants. *B. rufescens*, Lamk., is a tropical African species, cultivated and perhaps run wild on the coast near Madras. *B. diphylla*, Ham., is an extensively climbing Burmese species sometimes found in Madras Gardens, and at once recognised by its very small leaflets. *B. monandra*, Kurz, is a Madagascar shrub oi small tree, grown in gardens in Madras.

70. **Saraca**, Linn.

Trees or large shrubs. *Leaves* abruptly pinnate; leaflets of few pairs, coriaceous; stipules connate, intrapetiolar; stipels 0. *Flowers* showy, yellow orange or red, in short dense often lateral corymbose panicles; bracts small, deciduous; bracteoles sub-persistent, coloured. *Calyx* petaloid, tube elongate, cylindric, enclosing a lobed disk; lobes 4, ovate or oblong, imbricate. *Petals* 0. *Stamens* usually 7, rarely 3–4; filaments long, filiform;

anthers versatile, dehiscing longitudinally. *Ovary* stipitate, the stipe adnate below to one side of the disk, many-ovuled; style long, filiform; stigma small, capitate. *Pod* flat, oblong, coriaceous or almost woody, continuous within. *Seeds* obovate-orbicular, compressed, exalbuminous.

SARACA INDICA, Linn.; F. B. I. ii. 271; Bedd. Fl. t. 57. *Jonesia Asoca*, Roxb.; W. & A. 284; Wt. Ic. t. 206.

N. Circars, in Ganjam and Vizagapatam, in hill forests; S. Canara, Mysore and Travancore, scarce in a wild state, but frequently planted. The Asoka tree.

A small tree with brilliant orange-scarlet flowers and 2–3 pairs of oblong-lanceolate leaflets. Wood reddish-brown, soft. Vern. *Hind.* Asok; *Ur.* Oshoko; *Kan.* Ashunkar.

71. Tamarindus, Linn.

A tree. *Leaves* abruptly pinnate; leaflets many, small, opposite; stipules minute, caducous; stipels 0. *Flowers* in racemes at the ends of branches; bracts and bracteoles ovate-oblong, coloured, caducous. *Calyx*-tube turbinate, lined by the disk; lobes 4, lanceolate, membranous, imbricate. *Petals* 3, imbricate, the two lower reduced to scales. *Stamens* 3, perfect, the filaments connate about half-way up in a sheath split above, the rest reduced to bristle-like staminodes; anthers versatile, dehiscing longitudinally. *Ovary* stipitate, the stalk adnate to the disk, many-ovuled; style filiform; stigma capitate. *Pod* linear-oblong, incurved, thick, somewhat compressed, with brittle epicarp, pulpy mesocarp and leathery septate endocarp. *Seeds* obovate-orbicular, compressed, testa hard, albumen 0.

TAMARINDUS INDICA, Linn.; F. B. I. ii. 273; W. & A. 285; Bedd. Fl. t. 184.

All plains Districts, cultivated and self-sown, probably indigenous in Central Africa. The Tamarind.

A large evergreen tree of great importance, having rather small pink yellow-striped flowers, small acid leaflets and a pod whose pulp is made into preserves and also exported as a drug. The bark is dark grey and the wood, very hard and heavy, is of a dark purplish-brown colour and used for many household and agricultural purposes. Vern. *Hind.* Imli; *Ur.* Tentúli; *Tam.* Puli; *Tel.* Chinta.

72. Humboldtia, Vahl.

Trees. *Leaves* abruptly pinnate; leaflets 1 to 6 pairs, large, with prominent nerves connected by intramarginal loops; stipules persistent, usually leafy, of two parts—the erect stipules proper and a basal usually recurved appendage; stipels 0. *Flowers* in racemes, axillary to the upper leaves or on the branches or the stem; bracts ovate or oblong; bracteoles large, coloured, persistent. *Calyx*-tube turbinate or narrow, lined by the disk; lobes 4, subequal, coloured, imbricate. *Petals* 5 or 3, spathulate, clawed, exsert. *Stamens* 5 perfect alternating with 5 minute staminodes; filaments filiform; anthers oblong, versatile, dehiscing longitudinally. *Ovary* stipitate, the stalk adnate to the disk, few-ovuled; style long, filiform; stigma capitate. *Pod* oblong, oblique or falcate, compressed, dehiscent, coriaceous. *Seeds* transverse, compressed, albumen 0.

Leaflets 1 pair, subsessile, lanceolate, acuminate, with a broad gland at base, 5–6 in. long, 1–2 in. broad; stipules lanceolate, the appendages absent; racemes very short, on old wood ....1. *unijuga.*

Leaflets 2 pairs, subsessile, obovate-oblong, obtusely cuspidate, 4–7 in. long, 1·5–2 in. broad; stipules lanceolate, the appendages broadly reniform; racemes peduncled, about 6 in. long, axillary; branchlets sometimes swollen ....2. *Brunonis.*

Leaflets 3 or more pairs:—

Rhachis of leaves terete; leaflets reticulate:—

Internodes of the branchlets swollen and hollow; leaflets 3–5 pairs, elliptic-ovate, cuspidate, subcoriaceous, 3–4 in. long, 1–2 in. broad; stipules ovate, the appendages acuminate at ends; racemes about 3 in. long, axillary, erect .... 3. *laurifolia.*

Internodes not swollen; leaflets 3–4 pairs, oblong-lanceolate, acuminate, coriaceous, 5–10 in. long, 1·5–2·5 in. broad; stipules ovate, the appendages reniform; racemes peduncled, 5–6 in. long, tawny-velvety, axillary .... 4. *Vahliana.*

Rhachis of leaves flattened; leaflets 3–4 pairs, lanceolate, acuminate, chartaceous; 3–4 in. long, 1–1·5 in. broad; stipules ovate, the appendages small, falcate; racemes short, tawny-velvety, corymbose, in fascicles on the stems......................................5. *Bourdilloni.*

Rhachis of leaves winged, the wings obcordate; leaflets 4–6 pairs, oblong-lanceolate, long-acuminate, subcoriaceous, 6–15 in. long, 1·5–5 in. broad; stipules lanceolate falcate, the appendages ovate or reniform; racemes short, axillary or from old wood, corymbose, tawny-velvety .... 6. *decurrens.*

1. HUMBOLDTIA UNIJUGA, Bedd. Ic. t. 108; Fl. t. 183; F. B. I. ii. 274.

W. Ghâts, in dense evergreen forests in S. Travancore and Tinnevelly, at 3,000 to 4,000 ft.

A moderate-sized *tree with crimson flowers*, said to have a hard durable wood.

2. HUMBOLDTIA BRUNONIS, Wall. Pl. As. Rar. iii. t. 233; F. B. I. ii. 274; W. & A. 285; Wt. Ic. t. 1606.

W. Ghâts, in evergreen forests of S. Canara, Coorg, Mysore, Malabar and W. Nilgiris.

A diffuse shrub or small tree with orange flowers, the bracteoles and calyx tawny-pubescent.

3. HUMBOLDTIA LAURIFOLIA, Vahl; F. B. I. ii. 273; W. & A. 285; Wt. Ic. t. 1605.

W. Ghâts, in Malabar, *apparently very scarce.*

A small tree or shrub with numerous branches, the internodes of the branchlets curiously fistular, *the cavities* usually inhabited *by small ants*; *flowers* pink; pod acute; glabrous.

4. HUMBOLDTIA VAHLIANA, Wt. Ic. t. 1607-8; F. B. I. ii. 274.

W. Ghâts, in Malabar, Travancore and Tinnevelly, on low ground near rivers, Nilgiris (Wight).

A moderate-sized tree, the flowers white with a buff calyx, the pod acute at both ends, tawny-pubescent. Bark dark brown; wood light brown, moderately hard. Vern. *Mal.* Koratthi.

5. HUMBOLDTIA BOURDILLONI, Prain in Journ. As. Soc. Beng. lxxiii. 200.

W. Ghâts, on the Peermerd Ghât, Travancore, at 3,000 ft.

A moderate-sized tree reaching 50 ft. in height, with petals white, veined *with pink, the calyx crimson, the pod scarlet,* dolabriform, 4 in. by 1 in., pubescent.

7. HUMBOLDTIA DECURRENS, Bedd. *ex* Oliver in Hook. Ic. Pl. t. 2368

W. Ghâts, in valleys about Ponmudi in C. Travancore, at 500-3,000 ft., in evergreen forest; Tinnevelly (Beddome).

A moderate-sized tree with pink flowers and brown tomentose pod 3·5-5 in. long. Young leaves are white and pendulous. Bark bluish-green; wood greyish-brown. Vern. *Mal.* Kunthâni.

73. Hardwickia, Roxb.

Large tree. *Leaves* paripinnate, leaflets 1 pair with a minute bristle between; stipules small, caducous; stipels 0. *Flowers* small, numerous, in panicled racemes; bracts minute; bracteoles scale-like. *Calyx*-tube scarcely any; lobes usually 5, orbicular, petaloid, round the small basal disk, much imbricate. *Petals* 0. *Stamens* 10, alternately longer and shorter; filaments filiform; anthers versatile, dehiscing longitudinally. *Ovary* sessile, free, 2-ovuled; style filiform; stigma large, peltate. *Pod* a dry 1-seeded follicle, the seed at the apex where the pod dehisces, the base samaroid. *Seed* pendulous, obovate, compressed, 2-furrowed; testa crustaceous; albumen 0; cotyledons large, 2-grooved.

HARDWICKIA BINATA, Roxb. Cor. Pl. iii. 6, t. 209; F. B. I. ii. 270; W. & A. 284; Bedd. Fl. t. 26.

Deccan and Carnatic, in the Upper Godavari forests, Kistna and Guntúr, in the Ceded Districts, Mysore, Coimbatore and Salem, often forming gregarious forests.

A large deciduous tree with small yellowish flowers and *Bauhinia*-like leaflets. Bark dark grey, rough; wood extremely hard and heavy, dark red, streaked with black or purple, used for agricultural and many other purposes, but difficult to work. The leaves are cut for manure and the branchlets for the fibre of their bark. Vern. *Hind.* Anjan; *Tel.* Yepi; *Tam.* Acha; *Kan.* Kamra.

74. Kingiodendron, Harms.

Large tree. *Leaves* abruptly pinnate, the lower leaflets alternate, leaflets 4–7; stipules minute, caducous; stipels 0. *Flowers* very small, numerous, in panicles of racemes; bract ovate, very small, as are the 2 minute bracteoles. *Calyx*-tube almost wanting, disk very small; lobes 5, orbicular, gland-dotted, imbricate. *Petals* 0. *Stamens* 10 equal; filaments filiform, villous at base; anthers versatile, dehiscing longitudinally. *Ovary* sessile, villous at base, 2-ovuled; style subulate; stigma minute, oblique. *Pod* coriaceous or nearly woody, obovate, 1-seeded, the seed at the apex when the pod dehisces. *Seed* pendulous, compressed; testa membranous; cotyledons with balsam-bearing cells.

KINGIODENDRON PINNATUM, Harms in Engl. & Prantl Naturl. Pfl. Nacht. 194. *Hardwickia pinnata*, Roxb., F. B. I. ii. 270; W. & A. 284; Bedd. Fl. t. 255.

W. Gháts, in the evergreen forests of S. Canara (Beddome), Malabar, Travancore and Tinnevelly up to 3,000 ft.

A very large handsome evergreen tree reaching 100 ft. in height, with very small white flowers. Bark dark brown and green, rough; wood dark red or reddish-brown with a sticky resin, used for planking and furniture. The resin, like copaiba balsam, is of value. Vern. *Tam.* Madayan samprâni; *Mal.* Shuráli.

75. Cynometra, Linn.

Trees. *Leaves* abruptly pinnate, the leaflets usually few; stipules caducous; stipels 0. *Flowers* small, in short corymbs or racemes fascicled in the axils of the leaves or on old wood; bracts ovate, dry, imbricate, at length deciduous, smaller upwards; bracteoles none or membranous, coloured. *Calyx*-tube very short, enclosing the disk; lobes 4 or 5, oblong, imbricate, at length reflexed. *Petals* 5, oblanceolate, almost included. *Stamens* 10, rarely many; filaments filiform; anthers small, versatile, dehiscing longitudinally. *Ovary* sessile or shortly stalked, 2-ovuled; style slender; stigma capitate. *Pod* variously shaped, turgid or flattened, indehiscent, the pericarp thick, 1-seeded. *Seed* thick or compressed; cotyledons fleshy; albumen 0.

Leaflets 1 pair, lanceolate, falcate, acuminate, 1·5–3 in. long, ·5–1·25 in. broad, very unequal sided; pod flat, semicircular, rugose, orange when dry, ·75 in. long on the inner or straight side .... 1. *travancorica.*

Leaflets 2 pairs, oblanceolate, falcate, acute, the end ones the longest, 3–6 in. long, 1·5–2 in. broad, very unequal-sided; pod turgid, very rugose, ·5–1 in. long .... 2. *mimosoides.*

Leaflets 3 pairs:—

Leaflets obliquely obovate-oblong, obtusely acuminate and emarginate, 2·5–3·5 in. long, 1–1·25 in. broad, unequal-sided, the lowest pair the smallest, often only 1 in. long .... 3 *Beddomei.*

Leaflets obovate, emarginate at the blunt apex, cuneate at base, 1–1·5 in. long, ·5 in. broad, slightly unequal-sided, all pairs about equal; pod reniform globose, contracted in the middle, smooth, broader than long, ·6 in. in diam. .... 4. *Bourdillonii.*

1. Cynometra travancorica. Bedd. Fl. t. 316; F. B. I. ii. 267.

W. Gháts, in S. Travancore and Tinnevelly, at 2,000 to 3,000 ft. (Beddome); Tambracheri Ghát, Wynaad (Beddome, Barber).

A lofty tree with rosy-white flowers and only 1 pair of leaflets, which when young are very thin and creamy-pink in colour.

2. CYNOMETRA MIMOSOIDES, Wall. *C. ramiflora,* Linn.; F. B. I. ii. 267 *in part*; W. & A. 293; Bedd. Fl. t. 315.

W. Gháts, in S. Travancore (Beddome), apparently very scarce.

A moderate-sized tree with large leaflets and curiously wrinkled pods.

3. CYNOMETRA BEDDOMEI, Prain in Journ. As. Soc. Beng. lxvi. ii. 478. *C. malabarica,* Bedd. MS. in Herb. Kew.

W. Gháts, Tambracheri Ghát, Wynaad (Beddome).

A large tree with crimson young leaves and flowers in clusters from conspicuous imbricate bracts.

4. CYNOMETRA BOURDILLONII, Gamble in Kew Bull. 1908, 446.

W. Gháts, banks of the Parapár river, S. Travancore, at 500 ft. (Bourdillon).

A handsome moderate-sized tree with large clusters of flowers, small foliage and remarkable didymous small pod. Wood hard, yellow; bark blackish-green.

C. cauliflora, Linn., with 2 leaflets and flower racemes from the branches is sometimes found in gardens.

Subfamily III. MIMOSOIDEAE.

Trees or shrubs, sometimes climbing, rarely herbs. *Leaves* bipinnate or less commonly simply pinnate. *Flowers* small, regular, usually 5-merous, usually hermaphrodite, sometimes polygamous, generally in heads or spikes; bracts small, at the base of or on the peduncle, usually deciduous; bracteoles 0 or very small and usually deciduous. *Calyx* more or less campanulate with usually 5, sometimes 3, 4 or 6 valvate lobes, sometimes free. *Petals* as many as the sepals, valvate, free or connate in a lobed corolla. *Stamens* definite or indefinite; if definite as many as or twice as many as the sepals and petals, if indefinite usually very many, free or monadelphous. *Ovary* free, at the bottom of the calyx. *Pod* dehiscent or indehiscent, sometimes jointed. *Seeds* sometimes arillate, albuminous or exalbuminous; cotyledons flat.

Tribe XIV. ADENANTHEREAE.—Stamens definite, the anthers gland-crested at least in an early stage:—

Flowers in globose heads:—

Small herbs or undershrubs with small thin pods and small leaflets; lower flower neuter, the stamens reduced to elongate staminodes; seeds albuminous..........................76. **Neptunia.**

Large trees with thick woody pods and large leaflets; all or nearly all the flowers perfect; seeds exalbuminous................77. **Xylia.**

Flowers in elongate spikes:—

Large tendril-bearing climbers with very large broad pods and seeds; leaflets large and few; seeds exalbuminous...78. **Entada.**

Erect trees or shrubs with narrow pods and many leaflets; seeds albuminous:—

Unarmed trees with shortly stalked flowers and bright red seeds; leaflets fairly large..........................79. **Adenanthera.**

Prickly trees or large shrubs with sessile flowers:—

Pods turgid, straight; leaflets distant .... 80. **Prosopis.**

Pods thin, twisted; leaflets minute, contiguous
81. **Dichrostachys.**

Tribe XV. EUMIMOSEAE.—*Stamens definite, the anthers not gland-crested*; seeds albuminous:—

Pods straight, coriaceous, continuous, dehiscing at the sutures:—

Undershrubs with clavate stigmas.......... ... .**Desmanthus.**

Large shrubs or small trees with capitate stigmas......**Leucaena.**

Pods curved, with segmented valves and indehiscent sutures
82. **Mimosa.**

Tribe XVI. ACACIEAE.—Stamens indefinite, seeds exalbuminous:—

Stamens free; flowers capitate or spicate......................83. **Acacia.**

Tribe XVII. INGEAE.—Stamens indefinite, monadelphous, rarely only 2–3 times as many as the petals; seeds exalbuminous:—

Leaves bipinnate:—

Pods not septate between the seeds:—

Pods straight, with thin valves.......................84. **Albizzia.**

Pods curved or twisted with coriaceous valves
85. **Pithecolobium.**

Pods septate between the seeds.........................**Enterolobium.**

Leaves simply pinnate..86. **Inga.**

76. **Neptunia,** Lour.

Annual or perennial herbs or undershrubs, erect, prostrate or floating, the branches often compressed or angled. *Leaves* bi-

pinnate; leaflets many, small, sensitive; stipules persistent; stipels 0. *Flowers* small, sessile, in oblong or globose peduncled axillary heads; upper flowers ☿, lower ♂, lowest neuter with flattened staminodes; bracts minute. *Calyx* campanulate, small, 5-toothed. *Petals* 5, valvate, free or connate at the base. *Stamens* in ☿ and ♂ flowers 10, free, exserted; filaments slender; anthers gland-crested; staminodes in neuter flowers flattened. *Ovary* stalked, many-ovuled; style filiform; stigma minute, terminal, concave. *Pod* flat, membranous, oblong, 2-valved. *Seeds* transverse, compressed; with a filiform funicle.

A floating water-plant; leaves with 2–3 pairs of pinnae each with 8–15 pairs of leaflets, no gland on the rhachis; flower heads oblong, ·5 in. long; pods ·5–1 in. long, ·3–·5 in. broad, obtuse, cuspidate
1. *oleracea.*

Land undershrubs; rhachis with a gland between the lowest pair of pinnae:—

Erect and moderately stout; leaves with 3–5 pairs of pinnae each with 10–30 pairs of leaflets; flower heads oblong, ·5 in. long; pods 1–2 in. long, ·3 in. broad, obtuse, apiculate . . . .*plena.*

Prostrate, diffuse and slender; leaves with 1–3 pairs of pinnae each with about 15 pairs of leaflets; flower heads globose, ·2 in. in diam.; pods ·5–1 in. long, ·25 in. broad, subacute..................2. *triquetra.*

1. NEPTUNIA OLERACEA, Lour.; F. B. I. ii. 285. *Mimosa natans*, Roxb. Cor. Pl. t. 119. *Desmanthus natans*, W. & A. 270.

Circars and Carnatic, in ponds and tanks of fresh water.

An annual water-plant, the branches zig-zag, bearing radical fibres at the nodes and spongy floats on the internodes. Vern. *Tel.* Niru tavulupu, Nidra yung.

2. NEPTUNIA TRIQUETRA, Benth.; F. B. I. ii. 286. *Desmanthus triquetrus*, W. & A. 270; Wt. Ic. t. 756.

Circars, Deccan and Carnatic, in most Districts, in pasture lands.

Flowers yellow.

N. plena, Benth.; F. B. I. ii. 286 is a stouter plant, an introduction from America; Shevaroy Hills of Salem (Perrottet).

77. Xylia, Benth.

Trees. *Leaves* bipinnate, pinnae 1-pair; leaflets of few pairs, large; stipules small, deciduous; stipels 0. *Flowers* sessile in globose peduncled heads, the peduncles axillary, fascicled or

racemose; bracts 0; bracteole club-shaped. *Calyx* tubular-campanulate, 5-lobed. *Petals* 5, valvate, slightly connate at the base. *Stamens* 10, free, exserted; filaments slender; anthers *tipped with a stalked gland which is early deciduous. Ovary* sessile, many-ovuled; style filiform; stigma minute, terminal. *Pod* large, woody, flat, broadly falcate, septate between the seeds. *Seeds* oblong, compressed.

XYLIA XYLOCARPA, Taub. *X. dolabriformis*, Benth.; F. B. I. ii. 286; Bedd. Fl. t. 186. *Inga xylocarpa*, DC.; W. & A. 269.

Forests of the N. Circars, on the hills from Ganjam to Godavari, the chief tree of some forests; Deccan, in Hyderabad and Mysore, but scarce; W. Gháts, from S. Canara to N. Travancore.

A deciduous tree with 2 pairs of oblong lanceolate leaflets, the end pair up to 8 in. long, white flowers in globose heads and large woody dolabriform pods. Bark reddish-grey; wood hard, reddish-brown, durable and useful for sleepers and building purposes but difficult to work. Vern. *Hind.* Jambu; *Ur.* Boja, Kongora; *Tel.* Konda tangedu; *Tam.* Irúl; *Mal.* Irumalla.

78. **Entada**, Adans.

Large woody unarmed tendril-bearing climbers. *Leaves* bipinnate, the ultimate pinnae sometimes reduced to tendrils; stipules small, setaceous; stipels 0. *Flowers* very small, sessile, in long narrow spikes, polygamous. *Calyx* minute, campanulate, shortly 5-toothed. *Petals* free or slightly connate at the base, valvate. *Stamens* 10, free; *filaments filiform or slightly expanded* above; anthers shortly oblong, gland-crested. *Ovary* subsessile, many-ovuled; style filiform; stigma terminal, concave. *Pod* flat, woody, very large, of many discoid 1-seeded joints which with the persistent endocarp breakaway from each other and from the persistent thickened sutures. *Seeds* large, circular, compressed.

ENTADA SCANDENS, Benth.; F. B. I. ii. 286. *E. Pursaetha*, DC.; W. & A. 267.

Hill forests of the N. Circars; Deccan, in the Nallamalai Hills of Kurnool; W. Gháts, from S. Canara to Travancore, in evergreen forests.

A gigantic climber with very small yellowish flowers and huge

pods; the leaflets 1–3 in. long, oblong, shining, obtuse or emarginate. The thick stems are spirally twisted, and the climber is bad for forest trees and has to be cut. The round flat shining seeds are eaten and may be hollowed out into small boxes and other articles. Vern. *Hind.* Gila; *Ur.* Geredi; *Mal.* Kaka valli.

79. **Adenanthera**, Linn.

Trees. *Leaves* bipinnate, the pinnae opposite; leaflets many, alternate; stipules minute, caducous; stipels 0. *Flowers* in slender spiciform racemes, either solitary and axillary or terminal and panicled; bracts minute, bracteoles 0. *Calyx* short, campanulate, 5-lobed. *Petals* 5, connate below, valvate. *Stamens* 10, free, scarcely exserted, alternately long and short; anthers oblong, ending in a stipitate gland. *Ovary* sessile, many-ovuled; style filiform; stigma small, terminal. *Pod* linear, torulose, curved, septate within, the valves much twisted after dehiscence. *Seeds* thick, with a hard shining scarlet or scarlet and black testa.

Adenanthera pavonina, Linn.; F. B. I. ii. 287; W. & A. 271; Wt. Ill. t. 84; Bedd. Fl. t. 46.

Commonly cultivated in gardens and avenues, doubtfully wild.

A handsome deciduous tree with many ovate-oblong leaflets about 1 in. long, pale yellow flowers and conspicuous pods with scarlet lenticular seeds. Bark grey; wood hard, close-grained, red, useful for building and furniture. The red seeds are used as ornaments and for jewellers' weights. Vern. *Tel.* Bandi gurivenda; *Tam.* Ani kundamani; *Mal.* Manchadi.

80. **Prosopis**, Linn.

Shrubs or trees with thorns. *Leaves* bipinnate, pinnae usually few-paired; leaflets many, small, narrow; stipules small or 0, sometimes spinescent; stipels 0. *Flowers* small, in narrow spikes or subspicate racemes; bracts and bracteoles 0. *Calyx*-tube campanulate, shortly toothed or subentire. *Petals* 5, valvate, connate at base, at length free *Stamens* 10, free, slightly exserted; filaments filiform; anthers with a deciduous gland. *Ovary* sessile or stalked, many-ovuled; style filiform; stigma minute, terminal. *Pod* cylindric or linear, flat or turgid, often

torulose, straight or twisted, septate within, mesocarp thick, spongy. *Seeds* ovoid, compressed.

PROSOPIS SPICIGERA, Linn.; *F. B. I.* ii. 288; *W. & A.* 271; Roxb. Cor. Pl. t. 63; Bedd. Fl. t. 56; Brand. For. Fl. t. 25.

Deccan and Carnatic, from the Godavari southwards, on dry stony lands and on black cotton soil, in open forest, more rarely in thicker forest.

A small to moderate-sized deciduous tree with many thorns on broad bases, the leaflets distant, linear-oblong, about ·5 in. long, the pods cylindric, torulose and pulpy. Bark thick, grey, rough; wood purplish-brown, hard, a good fuel. The pods are eaten by cattle. Vern. *Hind.* Jhand; *Tel.* Chani; *Tam.* Perumbe.

81. Dichrostachys, DC.

Shrubs, the branchlets often ending in spines. *Leaves* bipinnate; pinnae paripinnate; leaflets usually very small and numerous, opposite, contiguous; stipules lanceolate or subulate; stipels 0. *Flowers* in cylindric peduncled spikes on short axillary branchlets, the upper flowers ⚥ yellow, the lower ones neuter, with pink filiform staminodes. *Calyx* campanulate, shortly toothed. *Petals* 5, valvate, connate below. *Stamens* 10, free, exserted; anthers ending in stalked glands. *Ovary* subsessile, many-ovuled; style filiform; stigma terminal, truncate. *Pod* linear, compressed, twisted up when ripe, continuous within, indehiscent or separating from the suture. *Seeds* obovate, compressed.

DICHROSTACHYS CINEREA, W. & A. 271; F. B. I. ii. 288; Roxb. Cor. Pl. t. 174; Bedd. Fl. t. 185.

N. Circars, Deccan and Carnatic, westwards to the dry slopes of the Ghâts, in dry scrub forests and on stony hills.

A thorny shrub or small tree with thorny branches, pretty tasselled flowers, twisted pods and very small pubescent leaflets. Bark grey or light brown; wood red streaked with black, very hard and tough and a good fuel. Vern. *Hind.* Vurtuli; *Tel.* Velturu; *Tam.* Vadatalla; *Kan.* Wadu.

Desmanthus virgatus, Willd., is an introduced American undershrub with flowers in small peduncled heads, small straight pods and small leaflets, occasionally found, especially near Madras.

Leucaena glauca, Benth., is a large shrub with rather large globose heads of white flowers, glaucous foliage with narrow

acute leaflets and flat strap-shaped pods. Probably North American in origin, it is frequently found in hedges and near villages in India.

82. Mimosa, Linn.

Herbs, shrubs or small trees, usually prickly. *Leaves* bipinnate; leaflets small, more or less sensitive, caducous, the rhachis *usually prickly*; *stipules* small; stipels small, often 2 to each pinna. *Flowers* small, polygamous, in globose heads on axillary, *solitary or fascicled* peduncles, the upper peduncles often forming a terminal raceme; bracts small, deciduous; bracteole 1, minute. *Calyx very small, campanulate*, shortly 4-toothed. *Petals* 4, connate below, valvate. *Stamens* as many or twice as many as the petals, exserted; filaments filiform; anthers small. *Ovary* stipitate, many-ovuled; style filiform; stigma minute, *terminal*. *Pod* flat, membranous, of several 1-*seeded joints that* separate when ripe from each other and from the persistent *sutures*. *Seeds* ovoid or orbicular, flattened, albuminous.

Pinnae of the leaves 1–2 pairs *digitately* arranged; stamens as many *as the petals*; *bracteoles stiff, bristly*; pods under 1 in. long, ·1–·2 in. broad, the sutures with many spreading bristles... .... 1. *pudica*.
Pinnae of the leaves *more* than 2 pairs, pinnate; stamens twice as many as the petals; bracteoles spathulate; pods more than 1 in. long, ·3 in. broad :—
  Leaves under 1 *in. long* with 3–5 pinnae; leaflets 7–8 pairs, shortly *oblong*, semicordate, ·05–·15 in. long, under ·1 *in. broad*, pubescent; peduncles usually longer than the leaves; pods grey-puberulous, the *sutures* spinose; seeds 5–6...2. *hamata*.
  Leaves much over 1 in. long, longer than the peduncles; pods glabrous :—
    Leaflets *semicordate* at base; sutures of pod with strong *recurved* prickles :—
      Pods usually *acutely pointed at* tip, 3–6-seeded, ·6 in. broad; leaves 3–4 in. long, pinnae 3–5 pairs about ·75 in. apart; leaflets oblong to obovate, up to ·25 in. long, the 4–5 pairs distant ·2 or more in. apart; *ovary glabrous* ... .3. *polyancistra*.
      Pods obtuse at tip, 6–8-seeded, ·4–·5 in. *broad*, *sometimes* slightly pubescent; leaves 2–3 *in. long*, pinnae 5–7 pairs about ·5 in. *apart*; *leaflets oblong*, the end ones subobovate, up to ·3 in. long, the 7–8 pairs touching, ·1–·2 in. apart; ovary minutely pubescent ....4. *Prainiana*.

Leaflets semirectangular at base; sutures of pod with few small or no prickles:—

Pods little curved, 2–3 in. long, ·6–·7 in. broad, sessile or shortly stalked, rounded or rarely acute at apex, seeds 5–7; leaves with 5–6 pairs of pinnae 2–3 in. long, pinnules 10–15 pairs, ·4–·7 in. long..5. *rubicaulis.*

Pods much curved, 3–3·5 in. long, ·3–·4 in. broad, long stalked, acute at apex and base; leaves with 6–8 pairs of pinnae, 1–1·5 in. long, pinnules 12–18 pairs, ·2–·3 in. long.........6. *angustisiliqua.*

1. MIMOSA PUDICA, Linn.; F. B. I. ii. 291.

All hot moist localities in the low country, probably introduced from tropical America. The Sensitive Plant. A diffuse undershrub with very sensitive leaves, pink flowers and bristly pods. It spreads very fast and is most troublesome and difficult to eradicate. Vern. *Hind.* Lajwati; *Tam.* Total vadi.

2. MIMOSA HAMATA, Willd.; F. B. I. ii. 291; W. & A. 268.

Deccan, from the Kistna southwards, often on black cotton soil.

A straggling prickly shrub with minute leaves and pink flowers.

3. MIMOSA POLYANCISTRA, Benth. in Trans. Linn. Soc. xxx. 422.

Deccan, in the Kurnool and Cuddapah Districts.

A straggling thorny shrub with pink flowers and distant rounded leaflets.

4. MIMOSA PRAINIANA, Gamble in Kew Bull. 1919, *ined.*

East Coast, in the Kistna District; Deccan, in Hyderabad to Anantapur.

A straggling thorny shrub with pink flowers and rounded leaflets, the pinnae in regular subequal pairs.

5. MIMOSA RUBICAULIS, Lamk.; F. B. I. ii. 291, *in part*; W. & A. 268; Hook. Ic. Pl. t. 156. *M. octandra*, Roxb. Cor. Pl. t. 200.

Deccan, forests of Cuddapah, Mysore, Coimbatore and Madura, usually in grassy savannahs and second-growth forests; W. Ghâts, on eastern slopes.

A large, very prickly shrub, the flowers pink.

6. MIMOSA ANGUSTISILIQUA, Gamble in Kew Bull. 1919, *ined.*

E. Ghâts, at Tummularu, Godavari Agency (Barber).

A shrub with pink flowers, few prickles and very small hirsute leaflets.

83. Acacia, Willd.

Trees or erect or climbing shrubs, usually armed. *Leaves* bipinnate, the pinnae even-pinnate; leaflets usually small, opposite; leaves sometimes transformed into phyllodes; stipules various, often spinescent; stipels 0. *Flowers* small, hermaphrodite or polygamous, usually 5-merous, in globose heads or cylindric spikes; peduncles axillary, solitary or fascicled or in terminal panicles; bracts 1 or 2, on the peduncle; bracteoles 1 to each flower, spathulate or subpeltate. *Calyx* campanulate, shortly lobed. *Petals* exserted, more or less united, rarely free. *Stamens* indefinite, free or very shortly connate at base; anthers small. *Ovary* sessile or stalked, 2–many-ovuled; style filiform; stigma small, terminal. *Pod* variable, ligulate or oblong, flat and dry or rarely turgid or coriaceous, continuous or septate within but not disarticulating. *Seeds* transverse or longitudinal, usually ovate or compressed; funicle often long and conspicuous.

Erect trees or shrubs with stipular spines, and without prickles:—
  Flowers in globose heads, the peduncles 2-bracteate:—
    Flower-heads on axillary peduncles:—
      Pod grey-downy, compressed, deeply indented on both sides between the seeds; flower-heads ·5 in. in diam., peduncle bracteate above the middle; leaves 2–4 in. long with 4–9 pairs of pinnae; leaflets linear-oblong, obtuse, ·2 in. long; spines straight, large ones slender, white, up to 2 in. long... 1. *arabica*.
      Pod cylindric, turgid, usually curved:—
        Peduncles bracteate at the apex:—
          Pod 2–3 in. long, ·5 in. in diam.; flower-heads ·5 in. in diam.; leaves 1–2 in. long with 4–8 pairs of pinnae; leaflets linear-oblong, acute, ·15–2 in. long, ·1 in. broad; spines straight, short, rarely over ·5 in. long......... 2. *Farnesiana*.
          Pod 3–4 in. long, ·3 in. in diam.; flower-heads ·2 in. in diam.; leaves 1–1·5 in. long with about 8 pairs pinnae; leaflets linear-oblong, obtuse, ·12 in. long, ·03–·04 in. broad; spines short and slender or stout and strong, up to 1·5 in. long .... *tortuosa*.
        Peduncles bracteate near the base; pod circinate, about 2 in. long, ·25 in. in diam.; flower-heads ·2 in. in diam.; leaves under 1 in. long with 3–4 pairs of pinnae; leaflets linear-oblong, minute, ·06 in. by ·01 in., obtuse, glabrous; spines both short and recurved and long, straight, slender, up to 2 in. long, white with brown spots......... 3. *planifrons*.

Pod flattened, straight or curved :—
Leaves glabrous, under 1 in. long; peduncles filiform, bracteate at or below the middle :—
Spines straight, some short thick, the rest white, often hollow, up to 2 in. long, ·2 in. diam. at base; pinnae 3 pairs; *leaflets elliptic or obovate, obtuse, about 5 pairs*, ·15 in. by ·075 in.; flower-heads ·2–·3 in. in diam.; pods very thin, flat, curved in a hook, ·2 in. broad, 5–7-seeded
4. *eburnea.*
Spines of 2 kinds, short recurved and long slender, white, 1·5–2 in. long; pinnae 4–6 pairs; leaflets linear-oblong, obtuse, ·1–·125 in. by ·025 in.; flower-heads ·3 *in. in diam.*; "pods linear, variously bent (W. & A.)"...5. *Roxburghii.*
Leaves hairy; peduncles fairly stout, bracteate about the middle; spines all straight :—
Longer spines slender, white, up to 1·25 in. long; branchlets and leaves scurfy-villous; leaves under 1 in. long with 6–10 pairs of pinnae; leaflets minute, ovate-oblong, ·075 in. by ·025 in.; flower-heads ·3 in. in diam.; pods 2–3 in. by ·2 in. broad, papery, obtusely pointed, straight or curved .... 6. *Campbellii.*
Longer spines stout, up to 2·5 in. long, ·2 in. broad at base; branchlets and leaves grey- or tawny-tomentose; leaves up to 3·5 in. long with 6–12 pairs of pinnae; leaflets oblong, ·1–·15 in. by ·05 in.; flower-heads ·5 in. in diam.; pods 4–6 in. by ·5 in.; thick, curved, sharply pointed
7. *tomentosa.*
Pod not known; *spines very stout*, dark brown, up to 2·5 in. long, ·3 in. in diam. at base; peduncles rather stout, the bracts below the middle; flower-heads ·5 in. in diam.; leaves glabrous *with 2–3 pairs of pinnae; leaflets oblong, obtuse*, ·25–·4 in. long by ·1–·2 in. broad, prominently nerved .... 8. *Wightii.*
Flower-heads in panicles, ·2–·3 in. in diam.; peduncles bracteate *at the middle*; spines *usually short, straight, up to* 1 in. long; leaves 1–2 in. long, with 5–15 pairs of pinnae; leaflets linear, subacute, about ·2 in. long; pods flat, strap-shaped, 4–8 in. long, ·3 in. broad.. 9. *leucophloea.*
Flowers in elongate spikes; peduncles usually 1-bracteate, bracts and bracteoles early caducous :—
Spines straight, short or *long, longest* up *to 2 in. and* ·35 *in.* in diam. at base, often hollow; flower-spikes 1–1·5 in. long, bracteate a little above the base; leaves glabrous, 1–1·5 in. long with 2–5

pairs of pinnae; leaflets oblong, ·2 by ·04 in.; pods flat, up to 3 in. long by ·8 in. brood, curved, obtuse, reticulate ..... 10. *Latronum*.

Spines short, hooked; flower-spikes 2–4 in. long:—

Leaflets 30–50 pairs, linear-oblong, pubescent, nerves obscure; calyx and petals white-villous, petals twice as long as calyx:—

Bark white; branchlets white-pubescent; leaflets ·25–·35 in. long; petals narrow; pod 3–5 in. long, ·5 in. broad, acute at both ends, grey, many-seeded ... . 11. *Suma*.

Bark brown; branchlets brown, glabrous; leaflets ·1 in long petals broad; pod 2–3 in. long, ·4 in. broad, acute at both ends, brown, few-seeded ....12. *Catechu*.

Leaflets 20–40 pairs, linear-oblong, glabrous, ·125 in. long, nerves prominent; branchlets red; petals 3 times as long as calyx, both glabrous; pod 2–2·5 in. long, brown, obtuse at apex with a point, few-seeded.......... ....13. *Sundra*.

Leaflets 10–20 pairs, ·25–·3 in. long, ·1 in. broad, oblong, glaucous; petals rather more than twice the ·05 in. calyx, both glabrous or the calyx minutely white pubescent; pods 3–5 in. long, ·75–1 in. broad, apiculate, 4–7-seeded.........14. *ferruginea*.

Leaflets 6–8 pairs, ·75–1·25 in. long, ·4–·5 in. broad, obovate-oblong, glaucous; petals about twice the ·1 in. calyx, both glabrous; pods 6–8 in. long, 1 in. broad, thick, 6–9-seeded 15. *lenticularis*.

Climbing shrubs, with prickles on stems and leaf rhachises, no stipular spines; peduncles bracteate:—

Pods thin, flat, coriaceous, the sutures straight, often thickened; stipules and bracts lanceolate:—

Leaflets more or less distant, not overlapping; flowers sessile:—

Glands near the base of the petiole flat; leaflets glabrous:—

Petiole gland oblong, up to ·3 in. long; pinnae 5–6 pairs, leaflets 20–30 pairs, ·15 in. apart, oblong, obtuse, truncate at base, ·5–·6 in. long, ·125 in. broad; pod 7 in. long, 1·25 in. broad, the sutures thick ....16. *Hohenackeri*.

Petiole gland elliptic, ·1–·2 in. long, somewhat convex; pinnae 6 pairs, leaflets 10–12 pairs, ·2 in. apart, oblong-falcate, acute, subcordate at base, ·4–·75 in long, ·1–·3 in. broad; pod 4–5 in. long, 1 in. broad, obtuse, the sutures slender ...... 17. *caesia*.

Glands near the base of the petiole conical; pinnae 10–14 pairs, leaflets 25–40 pairs, touching but not overlapping, oblong-falcate, apiculate, truncate at base, pubescent beneath, ·2–·3 in. long, ·1–·2 in. broad; pod 5–6 in. long, ·5–·75 in. broad, brown-velvety when young ....18. *torta*.

Glands near the base of the petiole columnar; pinnae 8 pairs, leaflets 10–17 pairs, oblong, apiculate upwards, obliquely and subequally truncate at base, ·4 in. long, ·1–·15 in. broad; pod 4–5 in. long, ·75–1 in. *broad, thin, glabrous*

19. *columnaris.*

Leaflets closely set and overlapping, semi-truncate at base; flowers pedicellate:—

Leaflets ·3–·4 in. long, ·04–·07 in. broad, linear-oblong, obtuse or acute, ciliate on the margins, otherwise glabrous; pedicels very short; pod 6–8 in. long, ·75–1·25 in. broad, the sutures thick .... 20. *pennata.*

Leaflets ·2–·3 in. long, ·03–·04 in. broad, linear, acute, slightly pubescent beneath; pedicels longer; pod about 4 in. long, ·5 in. broad, the sutures only slightly raised .... 21. *canescens.*

Pods thick, fleshy, much wrinkled when dry, depressed between the seeds and often indented on the sutures; stipules and bracts ovate-cordate:—

Pinnae 4–6 pairs, leaflets about 18 pairs, ·5–·75 in. long, ·15–·2 in broad; ovary pubescent; pod 1–1·25 in. broad .... 22. *rugata.*

Pinnae 8 *pairs or more*, leaflets more than 20 pairs, ·25–·3 in. long, ·04–·1 in. broad; ovary glabrous; pod ·75 in. broad

23. *concinna.*

1. Acacia arabica, Willd.; F. B. I. ii. 293; W. & A. 277; *Roxb. Cor. Pl. t.* 149; Bedd. *Fl. t.* 47.

Circars, Deccan and Carnatic, in dry localities. Either gregarious in patches of forest, especially on old tank beds and black cotton soil, or in groups or single trees among fields. Often cultivated and perhaps, although so common, not truly indigenous. The Babúl tree.

A moderate-sized tree with golden-yellow flowers, long white thorns and characteristic whitish-tomentose torulose pods which are eaten by cattle. Bark dark brown, rough; wood reddish-brown, hard and strong, useful for agricultural and many other purposes. Vern. *Hind.* Babúl, Kikar; *Tel.* Nalla túma; *Tam.* Karuvelam.

2. Acacia Farnesiana, Willd.; F. B. I. ii. 292; Bedd. Fl. t. 52. *Vachellia Farnesiana*, W. & A. 272; Wt. Ic. t. 300.

Circars, Deccan and Carnatic, cultivated and run wild. quite naturalized even up to 5,000 feet.

A thorny shrub with bright yellow very fragrant flowers

giving the perfume "Cassie." Vern. *Hind.* Wilayati kikar; *Tel.* Kusturi; *Tam.* Vedda vala; *Kan.* Jali.

Acacia tortuosa, Willd., is a large thorny shrub or small tree, native of S. America, occasionally found in cultivation in gardens in the low country.

3. ACACIA PLANIFRONS, W. & A. 276; F. B. I. ii. 293 *in part*; Trim. Fl. Ceyl. t. 35.

South Carnatic, in Madura, Tinnevelly and S. Travancore, gregarious; cultivated in Bellary and elsewhere. The Umbrella thorn.

A small tree with white flowers and very minute leaflets, having spreading branches which form an umbrella-shaped top. Bark greyish-brown; wood pale yellow, hard and heavy, used for implements and as fuel. Vern. *Tam.* Odai.

4. ACACIA EBURNEA, Willd.; W. & A. 276; F. B. I. ii. 273 *in part.*

Deccan and Carnatic, from Mysore to Coimbatore and Tinnevelly.

A small tree with red-purple corolla and yellow stamens and large ivory-white thorns, the pods papery, the leaflets few and comparatively large. Vern. *Tam.* Chilodai.

5. ACACIA ROXBURGHII, W. & A. 276. *A. planifrons,* W. & A.; F. B. I. ii. 293 *in part. Mimosa eburnea,* Roxb. Cor. Pl. t. 199.

Deccan, from Mysore and Bellary southwards.

A small thorny tree, with apparently yellow flowers on very slender peduncles.

6. ACACIA CAMPBELLII, Arn. in Nov. Act. Nat. Cur. xviii. 333.

Circars, in forests near the coast from Godavari to Nellore; Deccan and Carnatic, especially in Cuddapah; often on black cotton soil.

A small branchy tree with apparently pink flowers and a yellowish-white hard wood. Vern. *Tel.* Marmati; *Tam.* Udai vél.

7. ACACIA TOMENTOSA, Willd.; F. B. I. ii. 294; W. & A. 276.

N. Circars, from Ganjam to Godavari; Deccan, in Coimbatore, scarce.

A small tree with greenish-white flowers and large broad-based spines. Vern. *Tam.* Anaimalli.

8. ACACIA WIGHTII, Bak. in F. B. I. ii, 298.
   S. Carnatic, in Travancore and Tinnevelly (Wight), on the sea coast.
   A small tree with very large spines and rather large leaflets.

9. ACACIA LEUCOPHLOEA, Willd.; F. B. I. ii. 294; W. & A. 277; Bedd. Fl. t. 48; Brand. For. Fl. t. 27. *Mimosa leucophloea*, Roxb. Cor. Pl. t. 150.
   Circars, Deccan and Carnatic, in dry deciduous forests.
   A moderate-sized or large tree with pale yellowish-white flower heads in large terminal panicles. Bark grey and smooth when young, dark brown and rough when old; wood reddish-brown, hard and tough, a good fuel. The bark is used in distilling and gives a good rough fibre. Vern. *Hind.* Nimbar, Safed babúl; *Tel.* Tella túma; *Tam.* Velvelam.

10. ACACIA LATRONUM, Willd.; F. B. I. ii. 296; W. & A. 273; Wt. Ic. t. 1157.
   Deccan and Carnatic from the Kistna river southwards, gregarious on poor soils and forming extensive forests in places as in Guntur, Madura and S. Travancore.
   A remarkable little tree with the habit of *A. planifrons* in its umbrella shape, but smaller. It has white flowers and very large white spines in pairs, often hollow and tenanted by ants. Bark dark reddish-brown; wood reddish, very hard, a good fuel. Vern. *Tel.* Paki tumma; *Tam.* Károdei.

11. ACACIA SUMA, Buch.-Ham.; F. B. I. ii. 294. *A. Catechu*, W. & A. 272 *excl. syn.*; Bedd. Fl. t. 49.
   N. Circars, common; Deccan and Carnatic, in dry forests, to Coimbatore and the Shevaroy Hills.
   A medium-sized pretty tree with white bark, white flowers and pubescent leaves with very many leaflets. Wood dark brown, hard and heavy. Vern. *Ur.* Gonharea.

12. ACACIA CATECHU, Willd., F. B. I. ii. 295. *Mimosa Catechu*, Roxb. Cor. Pl. t. 175.
   N. Circars, in Ganjam (Gamble).
   A moderate-sized deciduous tree with pale yellow flowers. Bark dark greyish-brown, rough; wood red, hard and close-grained. From it the tan "Cutch" is extracted. Vern. *Hind.* Khair; *Ur.* Khoiru.

13. ACACIA SUNDRA, DC.; F. B. I. ii. 295; W. & A. 273; Bedd. Fl. t. 50. *Mimosa Sundra*, Roxb. Cor. Pl. t. 225.

Deccan and Carnatic, from the Kistna southwards to Cape Comorin, but most common in the Ceded Districts.

A moderate-sized tree with yellowish-white flowers, red branchlets and leaves with fewer leaflets than Nos. 11 and 12. Bark rusty brown; wood reddish-brown, hard and tough and useful for agricultural purposes, rice-pounders, fuel and "cutch." Vern. *Tel.* Sandra; *Tam.* Karangali.

14. ACACIA FERRUGINEA, DC.; F. B. I. ii. 295; W. & A. 273; Bedd. Fl. t. 51.

N. Circars, Deccan and Carnatic, in dry forests, to the E. slopes of the W. Gháts.

A large, deciduous, pretty tree with pale yellow flowers, glaucous leaves, *Albizzia*-like pods and few spines. Wood olive-brown, very hard, used for building and agricultural purposes. Vern. *Tel.* Ansandra; *Tam.* Velvelam.

15. ACACIA LENTICULARIS, Buch -Ham.; F. B. I. ii. 296.

N. Circars, forests of Ganjam (Fischer).

A deciduous tree with greyish-white flowers, glaucous leaves, large pods with thickened sutures and few spines. Wood very hard, olive-brown.

16. ACACIA HOHENACKERI, Craib in Kew Bull. 1915, 408.

W. Gháts, Kundahs range of Nilgiris (Hohenacker), Coonoor (Bourne).

A climbing shrub with small recurved prickles and large thick pod.

17. ACACIA CAESIA, Willd. *A. Intsia*, W. & A. 278 *excl. most synonyms*.

Deccan, Hills of Cuddapah; W. Gháts, in the Anamalais.

A climbing shrub with rather large prickles and few rather large leaflets.

18. ACACIA TORTA, Craib. *A. caesia*, W. & A. 278 *not of* Willd. *Mimosa torta*, Roxb.

N. Circars, hills of Ganjam and Godavari; Deccan, in Hyderabad, Bellary, Mysore and Coimbatore; W. Gháts, in dry forest southwards to S. Travancore.

A large prickly climbing shrub, sometimes very pubescent, occasionally nearly glabrous.

19. ACACIA COLUMNARIS, Craib in Kew Bull. 1915, 410.
W. Coast and W. Gháts in S. Canara and Mysore (Hohenacker, etc.).
A prickly climbing shrub.

20. ACACIA PENNATA, Willd.; F. B. I. ii. 297 *in part*; W. & A. 277 *in part*.
N. Circars, Deccan and E. slopes of W. Gháts, up to 5,000 ft., in moderately dry forest, in ravines and along streams.
A large very prickly climbing shrub, nearly glabrous.

21. ACACIA CANESCENS, Grah. *A. pennata* var. *canescens*, F. B. I. ii. 298.
Deccan and Carnatic, in dry forests and scrub lands up to 5,000 ft., southwards to S. Travancore.
A large prickly climbing shrub, recognised by its minute, very narrow leaflets and pubescent branchlets and inflorescence.

22. ACACIA RUGATA, Ham. *A. concinna*, DC. var. *rugata*, Baker in F. B. I. ii. 297.
N. Circars, in Ganjam (Barber).
A stout, prickly, straggling or climbing shrub, chiefly of waste lands, the pods large and fleshy, used like those of *A. concinna*.

23. ACACIA CONCINNA, DC.; F. B. I. ii. 296; W. & A. 277.
Deccan and Carnatic and W. Coast.
A stout very prickly climbing shrub, chiefly of open waste lands, the calyx red and corolla white, the pods fleshy and rugose, used as a substitute for soap. Vern. *Hind.* Ban ritha; *Tel.* Sigekai.

Several species of *Acacia* have been introduced from Australia and planted about the hill stations of the W. Gháts. Most of them are, however, only garden plants, but two have been so largely grown to supply timber and fuel that they deserve special notice. They are:

1. ACACIA MELANOXYLON, R. Br. The Black Wattle. A large tree, easily recognised by its leaves, bipinnate when young, very soon being transformed into oblong-falcate or lanceolate phyllodes. The flowers are white and the pods narrow and much curved. It is largely grown for its excellent timber and as a good fuel tree.

2. ACACIA DEALBATA, Link. The Silver Wattle. A small

tree with silvery foliage of bipinnate leaves which do not change into phyllodes, yellow very sweet-scented panicles and heads of flowers and narrow pods, the sutures not or little constricted between the seeds. It is largely grown in coppice as a fuel, and the bark is a useful tan, not so valuable, however, as that of the very closely allied *A. decurrens*, Willd., which has also been planted to a small extent. It differs by the foliage not being silvery and the pods distinctly constricted between the seeds.

84. **Albizzia**, Durazz.

Trees or shrubs without thorns or prickles, rarely climbing. *Leaves* evenly bipinnate; pinnae even-pinnate; leaflets of various sizes; stipules usually small, sometimes large and foliaceous; stipels 0. *Flowers* in globose heads, rarely in spikes; peduncles distinct, axillary or in terminal panicles; bracts 2 or none; bracteoles under the flowers very small, caducous. *Calyx* campanulate or tubular, 5-lobed. *Petals* 5, connate in a funnel-shaped corolla. *Stamens* indefinite, monadelphous at the base, filaments long exserted; anthers very small. *Ovary* sessile or shortly stalked, many-ovuled; style filiform; stigma minute. *Pod* large, thin, flat, straight, continuous within, indehiscent or subdehiscent. *Seeds* ovate or orbicular, compressed, exalbuminous, the funicle filiform.

Flowers in globose heads; trees :—
Leaflets large, usually more than ·75 in. long :—
Flowers sessile :—
Leaflets obliquely ovate, broad and rounded at base on the upper, narrower and attenuate on the lower side of the midrib, 1–1·5 in. long; ·75–1 in. broad, slightly villous beneath; calyx tubular, glabrous, ·1 in. long; pods thin, orange-brown, ·8 in. broad .... 1. *procera*.
Leaflets oblong, curved upwards, broadest on the lower side of the midrib, rounded or semicordate at base, ·75–1 in. long, ·25–·5 in. broad, pubescent beneath; calyx campanulate, ·05 in. long, glabrous; pods moderately thick, brown, 1–1·5 in. broad. 2. *odoratissima*.
Flowers pedicelled :—
Leaflets broadly oblong, curved upwards, broadest on the lower side of the midrib, obtuse or retuse at apex, rounded at base, the end ones semicordate, slightly pubescent beneath, 1–2 in.

long., ·5–·75 in. broad; calyx tubular, ·125 in. long, puberulous; pods thin, straw-coloured, 1–2 in. broad ....3. *Lebbeck.*

Leaflets oblong, slightly falcate, broadest on the lower side of the midrib, rounded or semicordate at base, appressed pubescent when young, ashy-grey when dry; ·5 in. long, ·2 in. broad; calyx campanulate, ·05 in. long, puberulous; pods moderately thick, red, 1–1·5 in. broad ....4. *Thompsoni.*

Leaflets small, under ·75 in. long.

Leaflets rounded at apex, the midrib nearly central, but slightly nearer the upper edge; pedicels short.

Leaflets broad, 1·5 in., half as broad as long, very grey-pubescent, base obliquely truncate on the upper, semicordate on the lower side; calyx tubular-campanulate, puberulous; pod thin, flat, ·5–1 in. broad, brown ....5. *Lathamii.*

Leaflets narrow, ·1 in., one-fourth as broad as long, glabrous or ciliate on the edges, attenuate on the upper, rounded on the lower side; calyx campanulate, puberulous; pod thin, flat, 1–1·25 in. broad, greyish-brown ... .:...........6. *amara.*

Leaflets acute at apex, falcate, semitruncate at base, the midrib close to the upper edge, ·1 in. broad, ciliate on the margins and midrib; stipules large and conspicuous; pedicels very short; calyx funnel-shaped, pubescent; pod ·75–1·5 in. broad, thin, pale-brown ....7. *marginata.*

Flowers in axillary spikes; leaflets very many, linear, acute, the midrib near the upper margin; villous on the midrib beneath; pods rather thick, with raised sutures, 3 in. by ·5 in................. *lophantha.*

1. Albizzia procera, Benth.; F. B. I. ii. 299; Brand. For. Fl. t. 26. *Mimosa procera*, Roxb. Cor. Pl. t. 121. *Acacia procera*, Willd.; W. & A. 275.

N. Circars and Deccan, in hill forests, not very common except along river banks; W. Gháts, in deciduous forests. *Often planted for ornament or in avenues.* White Siris.

A very large deciduous tree, conspicuous for its yellowish-white bark and head of spreading branches. Flowers greenish-white, rather small. Wood brown, hard, resembling walnut, useful for many purposes in building and agriculture. Vern. *Hind.* Safed siris; *Ur.* Sarapatri, Sirsi; *Tel.* Tella chinduga; *Tam.* Konda vaghe; *Mal.* Karun thagara.

2. Albizzia odoratissima, Benth.; F. B. I. ii. 299; Bedd.

Fl. t. 54. *Mimosa odoratissima*, Roxb. Cor. Pl. t. 120. *Acacia odoratissima*, Willd.; W. & A. 275.

Mixed forests in all Forest Districts, up to 3,000 ft. in the hills.

A large tree, almost deciduous though never quite leafless, with sweet-scented white flowers with yellow anthers. Bark dark grey with irregular cracks; wood dark brown, hard and close-grained, useful for many purposes, especially for wheels, oilmills and furniture. Vern. *Hind.* Kala siris; *Ur.* Sirsi tentura; *Tel.* Chinduga; *Tam.* Karu vagei; *Mal.* Puli vaga.

var. *mollis*, Benth. Leaflets and leaf rhachises densely grey or tawny-velvety. Coimbatore forests (Cleghorn).

3. ALBIZZIA LEBBECK, Benth.; F. B. I. ii. 298; Bedd. Fl. t. 53. *Acacia speciosa*, Willd.; W. & A. 275.

All plains Districts, cultivated and run wild, but doubtfully indigenous. Siris.

A large deciduous tree, with rather large white flowers and very long greenish stamens, the pods characteristic and long remaining on the tree when ripe. Bark brownish-grey; wood dark brown, streaked, hard and useful for building and agricultural purposes. Vern. *Hind.* Siris; *Ur.* Tinia; *Tel.* Dirasana; *Tam.* Vagei; *Mal.* Vága.

4. ALBIZZIA THOMPSONI, Brandis in Ind. For. xxv. 284.

N. Circars, in Ganjam forests; Deccan, in Cuddapah and Coimbatore, up to 3,000 ft.

A large deciduous tree with pale-yellow flowers and pink anthers. Vern. *Hind.* Sailari; *Tel.* Kondala.

5. ALBIZZIA LATHAMII, Hole in Ind For. Records iv. 4. 153.

S. Carnatic, in Tinnevelly and Ramnad, up to 1,200 ft. (Wight, Latham, Hole), in dry deciduous forest.

A much-branched small tree with purplish-red white-lenticellate bark, short leaves and small pods.

6. ALBIZZIA AMARA, Boivin; F. B. I. ii. 301; Bedd. Fl. t. 61. *Acacia amara*, Willd.; W. & A. 274. *A. Wightii*, Grah.; W. & A. 274. *Mimosa amara*, Roxb. Cor. Pl. t. 122.

N. Circars, in Vizagapatam and Godavari; Deccan and Carnatic, in dry forest lands to S. Travancore and up to 3,000 ft.

A moderate-sized deciduous tree with pinkish-white flowers

and leaves with very many very small leaflets, the young shoots yellow-pubescent. The wood is purplish-brown with lighter bands, very hard and strong, used in building and agricultural work. Vern. *Tel.* Nalla renga; *Tam.* Wúnja; *Mal.* Varacchi.

7. ALBIZZIA MARGINATA, Merr. *A. stipulata*, Boiv.; F. B. I. ii. 300; Bedd. Fl. t. 55. *Acacia stipulata*, DC.; W. & A. 274.

N. Circars and Deccan, in hill forests; W. Gháts, in deciduous forests and up to 3,000 ft. or higher; sometimes planted as a shade tree for coffee.

A large deciduous tree with white flowers with pink filaments and leaves with very many falcate leaflets. Bark grey, horizontally furrowed; wood brown, soft, of less value than that of the other species. Vern. *Hind.* Siran; *Tel.* Konda chiragu; *Tam.* Pili vagei; *Mal.* Potta vaga.

Albizzia lophantha, Benth. is an Australian shrub, cultivated and run wild on the Nilgiris and Pulneys.

85. **Pithecolobium**, Mart.

Erect trees or shrubs, unarmed or with spinescent stipules or axillary spines. *Leaves* bipinnate, pinnae even-pinnate; stipules various; stipels 0. *Flowers* usually hermaphrodite, in globose heads on solitary fascicled or racemed peduncles, axillary at the ends of branches; bracts small; bracteoles under the calyx caducous or sometimes persistent. *Calyx* campanulate, shortly 5-toothed *Petals* 5, rarely 6, connate in a tubular corolla with 5 valvate lobes. *Stamens* monadelphous, much exserted; anthers small. *Ovary* sessile or stalked, many-ovuled; style filiform; stigma minute. *Pod* strap-shaped, circinate or falcate, sometimes coriaceous, sometimes moniliform, usually dehiscent and much twisted, the sutures not thickened. *Seeds* ovate or orbicular, compressed, sometimes arillate.

Stipules spinose:—

Pinnae 1 pair, each with 1 pair of leaflets reaching 2 in. in length; flowers in close heads in long narrow terminal panicles; pods twisted, coriaceous, the seeds with a white edible aril. ..... 1. *dulce.*

Pinnae 1–2 pairs, each with 5–8 pairs of oblong leaflets reaching ·75 in. in length; flowers in axillary heads on long peduncles; pods curved, not twisted, thick, with 6–8 moniliform rounded joints with flat circular seeds.................................. ......2. *umbellatum.*

Unarmed :—

Leaflets numerous, small, trapezoid, coriaceous, tawny-villous beneath, the margins incurved, ·3–·5 in. long, glands many, 1–3 on the petiole, 1 half-way between each pair of the 3–12 pairs of pinnae; calyx and corolla golden-pubescent; pod 3–4 in. long, curved in a circle, orange within with 4–7 black seeds 3. *subcoriaceum.*

Leaflets few, large, 1–4 pairs; glands 1 on the petiole, 1 each at the base of each pinna and leaflet; bracteoles lanceolate, persistent :—

Pinnae 1–2 pairs, leaflets up to 4 pairs, lanceolate, acuminate, glabrous, black when dry, reaching 7 in. long, 2 in. broad, unequal at base; calyx campanulate, ·075 in. long; corolla twice as long, lobes recurved; pod spirally curved, the valves ·5–·7 in. broad, red within.......................................4. *bigeminum.*

Pinnae 1 pair, leaflets 1–3 pairs, ovate, abruptly caudate-acuminate, glabrous, reticulate, green when dry, reaching 6 in. long, 3 in. broad, nearly equal at base; calyx short-campanulate, ·05 in. long; corolla twice as long, lobes spreading.... ..5. *gracile.*

1. Pithecolobium dulce, Benth.; F. B. I. ii. 302; Bedd. Fl. t. 188. *Mimosa dulcis*, Roxb. Cor. Pl. t. 99. *Inga dulcis*, Willd.; W. & A. 268; Wt. Ic. t. 198.

All dry plains Districts, cultivated as a hedge plant and run wild, native of tropical America.

A tree which, when allowed to grow, reaches a good size and gives a useful strong reddish-white wood, a good fuel, pods which are eaten by cattle and foliage which is eaten by goats. It makes a good strong hedge. Vern. *Tam.* Karkapilly.

2. Pithecolobium umbellatum, Benth.; F. B. I. ii. 303. *Inga umbellata*, W. & A. 270.

Eastern Districts (Wight, Cleghorn) scarce.

A low tree with thick moniliform pods, and heads of rather few pedicelled creamy-white flowers with very long stamens, thorns scarce. Vern. *Tam.* Iyamalai.

3. Pithecolobium subcoriaceum, Thw.; F. B. I. ii. 305. *P. anamallayanum*, Bedd. Fl. t. 189.

W. Gháts, in the Anamalais and the Hills of Travancore above 4,000 ft., in evergreen forests.

A small tree with pretty greenish-white flowers, foliage and pods. Wood yellowish, soft. Vern. *Tam.* Malei vágei.

4. Pithecolobium bigeminum, Mart.; F. B. I. ii. 303. *Inga bigemina*, Willd.; W. & A. 269.

W. Gháts, in evergreen forests up to 3,000 ft. from Mysore to Anamalais and Travancore, common in Wynaad; W. Coast, in S. Canara.

A small tree with white flowers and broad flat pod curved in a ring and orange-red inside with black seeds. Bark smooth, brown, thin; wood light brown, soft. Vern. *Tam.* Kal pakku; *Mal.* Mutha kolappan.

5. Pithecolobium gracile, Bedd. in Madr. Journ. Sc. 1864, 44; Brand. Ind. Trees 274.

W. Gháts, in the Wynaad forests at 3,000 ft. (Beddome, Gamble); Coorg (Bourne).

A slender shrub or small tree with white flowers and long caudate points to the leaflets.

Enterolobium Saman, Prain, the Rain tree is an introduction from S. America, and is often grown as an avenue tree. Its growth is very fast, but the wood is useless.

86. Inga, Willd.

Trees or shrubs. *Leaves* simply pinnate. *Flowers* in spikes or globose heads, peduncled. *Calyx* tubular or campanulate, shortly 3–5-toothed. *Petals* combined in a tubular or funnel-shaped corolla with 3–5 lobes, the lobes valvate. *Stamens* indefinite, long-exserted, monadelphous; anthers minute. *Ovary* sessile, many-ovuled; style filiform; stigma minute. *Pod* linear, coriaceous, straight or curved, the sutures usually thickened. *Seeds* obovate or orbicular, compressed, sometimes with a pulpy aril.

Inga cynometroides, Bedd.; F. B. I. ii. 306. *Calliandra cynometroides*, Bedd. Fl. t. 317.

W. Gháts, in the Hills of S. Travancore in evergreen forest at 2,500–3,500 ft. (Beddome).

A middle-sized glabrous tree with thorny branches, having 1 pair of leaflets 3–4 in. long, flowers with 3-lobed calyx and corolla and flat glabrous coriaceous pod much thickened at the sutures.

Family LVI. ROSACEAE.

Herbs, shrubs or trees. *Leaves* alternate, rarely opposite, simple or compound; stipules free or adnate to the petiole,

rarely 0. *Flowers* usually regular and hermaphrodite. *Calyx*-tube free or adnate to the ovary, usually 5-lobed, often bracteolate. *Disk* lining the calyx-tube or forming a ring at its base. *Petals* 5, rarely 0, inserted under the margin of the disk, usually imbricate. *Stamens* perigynous, usually indefinite, in one or more series; filaments generally incurved in bud; anthers small, didymous. *Ovary* of one or more free or connate carpels; ovules 1 or more in each carpel; styles basal lateral or subterminal, free or connate; stigmas simple, penicillate or capitate. *Fruit* variable, of achenes berries or drupes, rarely capsular. *Seeds* erect or pendulous, exalbuminous; testa membranous or coriaceous; cotyledons plano-convex; radicle short.

Ovary superior; the ripe carpels not enclosed in the calyx-tube :—
  Flowers irregular; ovules 2, ascending; carpel 1, style basal
  1. **Parinarium.**
  Flowers regular; ovules 2, pendulous :—
    Carpel 1 :—
      Drupe erect; style terminal :—
        Petals large; endocarp hard, bony.......................**Prunus.**
        Petals very small; endocarp coriaceous ....2. **Pygeum.**
      Drupe inverted; style subbasal; endocarp coriaceous
      Prinsepia.
    Carpels many :—
      Ovules 2; pendulous; calyx ebracteolate; prickly shrubs :—
      3. **Rubus.**
      Ovule 1, erect; calyx bracteolate; herbaceous plants :—
        Achenes on a fleshy receptacle.......................4. **Fragaria.**
        Achenes on a dry receptacle ....5. **Potentilla.**
Ovary inferior; the ripe carpels enclosed in the calyx-tube :—
  Carpel 1; petals 0; herbaceous..............................6. **Alchemilla.**
  Carpels more than 1; petals present; trees or shrubs :—
    Carpels not confluent when ripe; prickly shrubs with compound leaves and adnate stipules.......................................7. **Rosa.**
    Carpels confluent when ripe; erect unarmed trees or shrubs with simple leaves and small stipules :—
      Flowers in panicles; ovary 5-celled.......................**Eriobotrya.**
      Flowers corymbose or fascicled :—
        Ovary 5-celled; endocarp cartilaginous.....................**Pyrus.**
        Ovary 2–3-celled; endocarp thin; evergreen trees
        8. **Photinia.**
        Ovary 2–5-celled; endocarp bony; rigid shrubs
        9. **Cotoneaster.**

1. Parinarium, Juss.

Trees. *Leaves* simple, alternate, evergreen, quite entire; stipules subulate or lanceolate. *Flowers* hermaphrodite, white or pink, in corymbose racemes, bracteate. *Calyx*-tube campanulate or funnel-shaped; lobes 5, imbricate. *Petals* 5, inserted on the mouth of the calyx-tube, sessile or clawed, deciduous. *Stamens* numerous; filaments connate at the base in a ring or unilateral bundle, filiform; anthers small. *Ovary* adnate to the side of the calyx-tube, 2-celled, the ovules erect; style basal, filiform; stigma truncate. *Fruit* an ovoid or spherical drupe, the stone 1–2-seeded, woody or bony. *Seeds* erect; testa membranous; cotyledons fleshy.

Leaflets 8–9 in. long, 3 in. broad, elliptic-lanceolate, glabrous racemes stout, axillary or terminal, slightly pubescent, about 4 in. long; flowers white .... 1. *indicum.*
Leaves 4–5 in. long, 1–1·5 in. broad, lanceolate, glabrous except the silky midrib beneath; racemes slender, drooping, usually axillary, silky-villous, about 2 in. long; flowers pink. ....2. *travancoricum.*

1. Parinarium indicum, Bedd. Ic. t. 109, Fl. t. 191; F. B. I. ii. 311.

   W. Ghâts, about the Carcoor Ghât, S.-E. Wynaad, in moist woods at 2,000–3,000 ft. (Beddome).

   A middling-sized evergreen tree.

2. Parinarium travancoricum, Bedd. Ic. t. 189; F. B. I. ii. 311.

   W. Ghâts, in the Travancore Hills, in evergreen forests at 2,000 ft. (Beddome, Bourdillon).

   A small graceful evergreen tree with straight cylindric stem. Bark smooth, mottled brown and white; wood hard, smooth, pink.

2. Pygeum, Gaertn.

Evergreen shrubs or trees. *Leaves* simple, alternate, persistent, entire or rarely toothed, sometimes with pitted glands near the base; stipules small, deciduous. *Flowers* small, in racemes, sometimes ♂ only by suppression of the ovary; bracts deciduous, in early bud forming a cone. *Calyx*-tube obconic urceolate or campanulate, usually villous within, deciduous usually in a ring

at the middle; lobes 5–6, very small. *Petals* 5–6, sometimes undistinguishable from the calyx-lobes with which they alternate, usually villous. *Stamens* normally 10, 20 or 30, in one or two rows, often irregular by the absence of some; filaments slender, incurved; anthers small. *Carpel* solitary at the base of the calyx-tube, ovoid or globose; style subulate; stigma capitate; ovules 2, collateral, pendulous. *Fruit* a transversely oblong obscurely 2-lobed indehiscent drupe; pericarp thin, dry or fleshy; cotyledons hemispheric; radicle minute, superior.

Leaves entire:—
  Calyx-lobes and petals unequal, the latter the longer:—
    Leaves ovate to broad-lanceolate, acuminate at apex, 4–6 in. long, 1·5–3 in. broad, not pitted; racemes slender, 2–3 in. long, pedicels ·1 in.; stamens more than 30 with long filaments; ovary glabrous with long slender style; drupe ·5 by ·7 in., dark purple, top slightly retuse.......................................1. *acuminatum.*
    Leaves lanceolate, acute at apex, 2–4 in. long, 1–1·5 in. broad, rarely pitted; racemes under 2 in. long, pedicels ·1 in.; stamens about 20 with short filaments; ovary glabrous with short style; drupe ·5 by ·8 in., purple, top slightly retuse .... 2. *sisparense.*
    Leaves ovate, obtusely acute at apex, rounded or subcordate at base and usually pitted; 4–6 in. long, 2·5–3 in. broad; racemes reaching 5 in. long, pubescent, pedicels ·1–·25 in. long; stamens about 20; ovary glabrous, with thick style; drupe ·6 by ·7 in., top not retuse.. 3. *Wightianum.*
  Calyx-lobes and petals nearly equal, similar, but the latter more obtuse; stamens normally 30; racemes 2–4 in. long, pubescent, pedicels ·1 in.; leaves lanceolate, long acuminate, up to 7 in. long, 2–3 in. broad; basal glands present or more often absent; drupe ·6 by 1 in., black, slightly retuse at top .... 4. *Gardneri.*
Leaves crenate-serrate, ovate or ovate-oblong, attenuate at base; petals oblong, ·1 in. long, glandular-ciliate, twice the length of the calyx-lobes; stamens 10–15, usually 10...................... 5. *Andersoni.*

1. Pygeum acuminatum, Coleb. in Trans. Linn. Soc. xii. 360, t. 18; F. B. I. ii. 318.
   E. Gháts, Rumpa Hills of Godavari at 2,500 ft. (Gamble).
   An evergreen tree, with fairly large leaves.
2. Pygeum sisparense, Gamble in Kew Bull. 1918, 238.
   W. Gháts, about Sispara in W. Nilgiris at 6,000–7,000 ft. (Gamble).

A small tree with small leaves racemes and flowers, the fruit large.

3. Pygeum Wightianum, Bl.; F. B. I. ii. 319. *P. ceylanicum*, Bedd. Fl. t. 59.

W. Gháts, from Mysore to the Nilgiris, Pulneys and Travancore Hills, at 3,000–6,000 ft.

A large and handsome tree with white flowers, the leaves, fruit and bark smelling of prussic acid. Bark dark brown, rough; wood hard, pink, mottled and streaked. Vern. *Tam.* Palan kacchi; *Mal.* Nai kambagam.

4. Pygeum Gardneri, Hook. f. in F. B. I. ii. 321. *P. acuminatum*, Wt. Ic. t. 993.

W. Gháts, in the hills of Malabar, Nilgiris, Pulneys and Travancore, above 3,000 ft.

A medium-sized tree, glabrous except the inflorescence, the leaf-glands only occasionally found.

5. Pygeum Andersoni, Hook. f. in F. B. I. ii. 320.

E. Gháts, Mahendragiri Hill in Ganjam at 4,500 ft. (Gamble, Fischer).

A tree or shrub, noticeable for its serrate leaves, glabrous except the margins of the rather long petals.

3. Rubus, Linn.

Creeping herbs or erect or climbing shrubs, usually prickly. *Leaves* alternate, simple or compound; stipules free or adnate to the petiole. *Flowers* in terminal or axillary corymbose panicles, rarely solitary, white or red; bracts various; bracteoles usually small or 0. *Calyx*-tube broad; lobes 5, persistent. *Disk* lining the calyx-tube. *Petals* 5. *Stamens* many, inserted on the mouth of the calyx-tube. *Carpels* many, on a convex receptacle; ovules 2, collateral, pendulous; style subterminal, filiform; stigma capitate. *Fruit* a cluster of small fleshy 1-seeded drupes crowded on the receptacle, rarely few. *Seed* pendulous; cotyledons plano-convex; radicle superior.

Leaves simple, 5-lobed, the under-surface, the nerves on the upper surface, the branchlets and inflorescence more or less clothed with white or fulvous tomentum; prickles comparatively few, short, recurved :—

Bracts boat-shaped or obovate, entire or dentate at apex; leaves up to 4 in. long, 3 in. broad, the lobes short, acute, again lobulate 1. *Wightii.*

Bracts broadly ovate or obovate, laciniate at apex:—

Leaves thick, deeply cordate, prominently and minutely rugose on both surfaces with very small areoles; bracts and stipules long-flabellately laciniate:—

Leaves orbicular in outline, up to 6 in. in diam., the lobes rounded, scarcely lobulate, the sinuses shallow; tomentum thick, fulvous; inflorescence dense...2. *rugosus* var. *Thwaitesii.*

Leaves ovate in outline, up to 9 in. long by 7 in. broad, the lobes acute, the end one long and usually again lobulate; tomentum short, white or pale fulvous; inflorescence loose 3. *Fairholmianus.*

Leaves thin, shallowly cordate, not minutely rugose, up to 6 in. long by 5 in. broad, the areoles rather large; bracts and stipules shortly laciniate; tomentum very thin, tawny; inflorescence lax 4. *Gardnerianus.*

Bracts pectinately laciniate with linear segments; leaves deeply cordate, not lobulate, rugose with small areoles:—

Petals very small, less than half the length of the calyx-lobes; leaves up to 5 in. long by 4·5 in. broad, the lobes, especially the end one, acute, the sinuses deep; inflorescence short or shortly paniculate ....5. *micropetalus.*

Petals nearly as long as the calyx-lobes; leaves up to 6 in. in diam., the lower lobes rounded or subacute, the end lobe acute; inflorescence large, in spreading panicles ....6. *fulvus.*

Leaves pinnately 3-foliolate, wrinkled, the end leaflet the largest; stipules subulate; petals white, as long as or longer than the calyx-lobes; fruit globose, orange ....7. *ellipticus.*

Leaves pinnately 5–7 foliolate, usually white beneath:—

Branches glabrous, glaucous, not glandular; leaves usually 7-foliolate, stipules subulate; petals pink, shorter than the calyx-lobes; fruit globose, black with white tomentum............................8. *niveus.*

Branches covered with glandular bristles and hairs; leaves usually 5-foliolate, stipules lanceolate; petals red, longer than the calyx-lobes; fruit globose, purple with white tomentum......9. *racemosus.*

1. Rubus Wightii, Gamble. *R. rugosus*, Wt. Ic. t. 225 *not of* Sm. *R. moluccanus*, Hook. f. in F. B. I. ii. 330 *in part only* (var. *a.* Thwaites Enum. Pl. Zeyl.).

Sivagiri hills, Tinnevelly (Wight).

A small species with pretty vine-like leaves and red fruits.

2. Rubus rugosus, Sm. in Rees Cycl. xxx. *R. moluccanus*, Linn.; F. B. I. ii. 330 *in part*.

Var. *Thwaitesii*, Focke. W. Ghâts, in the Nilgiri Hills at high levels, common on Dodabetta at 8,000 ft.

A large strongly-growing shrub with large purple-black fruits.

3. Rubus Fairholmianus, Gardn. in Calc. Journ. Nat. Hist. viii. 6. *R. moluccanus*, Hook. f. in F. B. I. ii. 330 *in part only* (var. γ. Thwaites Enum. Pl. Zeyl.).

W. Ghâts, in the Pulney Hills at 5,000–7,000 ft.

A large shrub with white tomentum and red fruits.

4. Rubus Gardnerianus, O. Kze. *R. moluccanus*, Hook. f. in F. B. I. ii. 330 *in part only* (var. δ. Thwaites Enum. Pl. Zeyl.). *R. macrocarpus*, Gardn.

W. Ghâts, at Udambadsholay, Travancore Hills, at 5,000 ft. (Meebold); E. Ghâts, Madgol Hills of Vizagapatam at 4,500 ft. *probably*.

A good-sized shrub with thin leaves, open reticulations to the leaves, many prickles and black fruit.

5. Rubus micropetalus, Gardn. in Calc. Journ. Nat. Hist. viii. 6. *R. moluccanus*, Hook. f. in F. B. I. ii. 330 *in part only* (var. β. Thwaites Enum. Pl. Zeyl.).

Tinnevelly District, at Kalivayalpil (Barber).

Apparently a small species, perhaps climbing, with deeply-lobed leaves, small petals and red fruit.

6. Rubus fulvus, Focke in Biblioth. Bot. lxxii. 81 (1909).

W. Ghâts, in W. Nilgiris, Bababudan Hills of Mysore, Atapadi Hills of Malabar, hills of Coimbatore, at 3,000–6,000 ft. (King, Fischer and others).

A strong-growing, perhaps climbing, species with large flower panicles and black-purple fruit.

7. Rubus ellipticus, Sm.; F. B. I. ii. 336. *R. Gowreephul*, Roxb.; W. & A. 298; Wt. Ic. t. 230. *R. Wallichianus*, W. & A. 298; Wt. Ic. t. 231.

N. Circars and Deccan, in the hills above 4,000 ft.; W. Ghâts, in all Districts, in open places, usually above 6,000 ft.

A large straggling shrub with stiff red hairs and prickles. The orange raspberry-like fruit is edible and good, it can be made into preserves.

8. Rubus niveus, Thunb. Dissert. 9, fig. 3 *not of* Wall. *R. lasiocarpus*, Sm.; F. B. I. ii. 339; W. & A. 299; Wt. Ic. t. 232.

N. Circars, Deccan and Carnatic, in hills above 4,000 ft.; W. Gháts, in all Districts, on Shola margins and in open forest.

A straggling shrub, the leaves usually very white beneath; fruit edible but dry and the seeds with a woolly coat.

Var. *subglaber*, Thw. Leaves not white beneath, glabrous except on the nerves; thorns large, recurved from broad bases.

Nilgiri and Pulney Hills, at high elevations.

9. Rubus racemosus, Roxb.; F. B. I. ii. 340.

Nilgiri hills, at high elevations, above 6,000 ft.

A straggling shrub very closely allied to *R. niveus*, chiefly differing in the glandular hairs, especially on the calyx-tube.

Rubus Idaeus, Linn., the Raspberry, is found in cultivation in hill stations.

4. Fragaria, Linn.

Perennial scapigerous herbs with creeping stolons. *Leaves* digitately 3- rarely 5-foliolate, rarely pinnate or simple; stipules adnate to the petiole. *Flowers* white or yellow, often polygamous, cymose on erect scapes; bracts leafy; bracteoles 5, close under the calyx. *Petals* 5. *Stamens* many, 1-seriate, persistent; filaments filiform; anthers didymous. *Carpels* many, on a convex receptacle; styles lateral; ovules 2, collateral, pendulous. *Fruit* of many achenes, sunk in the surface of the fleshy receptacle. *Seeds* minute; cotyledons plano-convex; radicle superior.

Flowers yellow, solitary, bracteoles broad, 3–5-fid at apex; leaflets 3–5, obovate, usually crenate; peduncles shortly whitish-villous, ·25–1 in. long; slender plants with the ripe receptacles red...1. *indica.*
Flowers white, in cymes, bracteoles deeply bifid in 2 lanceolate lobes; leaflets 3, obovate, coarsely dentate; peduncles densely golden-villous, 1–1·5 in. long; robust plants with the ripe receptacles white tinged with pink...2. *nilgerrensis.*

1. Fragaria indica, Andr.; F. B. I. ii. 343; W. & A. 300; Wt. Ic. t. 989.

W. Gháts, Nilgiri and Pulney Hills at 6,000–7,000 ft.

A small creeping strawberry, the fruit insipid.

2. FRAGARIA NILGERRENSIS, Schlecht.; F. B. I. ii. 344. *F. elatior*, W. & A. 300; Wt. Ic. t. 938.

W. Gháts, Nilgiri and Pulney Hills, above 6,000 ft.

A stout creeping wild strawberry, the fruit edible and pleasant.

Fragaria elatior, Ehrh., the Strawberry, is cultivated in hill gardens.

5. **Potentilla,** Linn.

Herbs or rarely shrubs, perennial or sometimes annual. *Leaves* digitately or pinnately compound, the leaflets usually lobed; stipules adnate to the petiole. *Flowers* white or yellow, rarely red, solitary or in corymbose cymes; bracts leafy; bracteoles 5, rarely 4, under the calyx. *Calyx* persistent, tube hemispheric or urceolate, concave at base; lobes 5, rarely 4, valvate. *Petals* 5. *Stamens* many, 1- or more-seriate, rarely definite. *Carpels* many, on a small dry receptacle; ovule solitary, pendulous; style persistent or deciduous, ventral or terminal. *Fruit* of many achenes, clustered on the dry receptacle. *Seeds* minute; radicle superior.

Leaves pinnate with 5–7 obovate coarsely-toothed leaflets, whitish beneath, softly golden-villous; flowers about ·5 in. in diam.; achenes smooth or very minutely wrinkled, pale, about ·1 in. long
1. *Leschenaultiana.*

Leaves digitately 5-foliolate, leaflets obovate or oblanceolate, silky-villous, green beneath, obtusely deeply crenate; flowers about ·25 in. in diam.; achenes dark, deeply wrinkled, scarcely ·05 in. long
2. *Kleiniana.*

1. POTENTILLA LESCHENAULTIANA, Ser.; F. B. I. ii. 350; W. & A. 301; Wt. Ic. t. 990.

W. Gháts, in the Nilgiri and Pulney Hills, above 6,500 ft.

A strong-growing perennial herb with yellow flowers.

2. POTENTILLA KLEINIANA, W. & A. 300; F. B. I. ii. 359; Wt. Ill. t. 85.

W. Gháts, in the Nilgiri Hills about Ootacamund at 7,000 ft.

A weak, usually prostrate herb with yellow flowers, sometimes stoloniferous.

6. Alchemilla, Linn.

Annual or perennial herbs. *Leaves* alternate, orbicular, lobed or deeply divided; stipules adnate to the petiole, sheathing the stem. *Flowers* minute, in corymbose cymes; bracts many; bracteoles 4–5, under the calyx-lobes. *Calyx*-tube campanulate, lobes 4–5, valvate. *Disk* adnate to the calyx-tube, large and thick at its mouth. *Stamens* 4–5, on the mouth of the calyx-tube. *Carpels* 1–5, stalked or sessile in the calyx-tube; style basal; stigma capitate. *Fruit* of 1–4 achenes enclosed in the membranous persistent calyx-tube.

ALCHEMILLA INDICA, Gardn.; F. B. I. ii. 361. *A. vulgaris*, Wt. Ic. t. 229.

Nilgiri and Pulney Hills, above 7,000 ft., chiefly at high elevations as on the top of Dodabetta, on open grass-land.

A perennial silky herb with prostrate stems covered with the dry remains of the stipules; flowers very small, green; leaves orbicular, 7–11-lobed, serrate.

7. Rosa, Linn.

Erect, sarmentose or climbing shrubs, usually prickly. *Leaves* alternate, imparipinnate; leaflets serrate; stipules adnate to the petiole. *Flowers* terminal, solitary or corymbose, white, yellow or red; bracts rarely persistent; bracteoles 0. *Calyx*-tube globose, ovoid or flask-shaped, the mouth contracted; lobes 4–5, imbricate. *Petals* 4–5, usually large. *Disk* lining the calyx-tube, thickened in a ring at the mouth. *Stamens* many, inserted on the disk. *Carpels* many, rarely few, in the bottom of the calyx-tube; styles subterminal, free or connate above; stigma thickened; ovule solitary, pendulous. *Fruit* a fleshy calyx-tube (rose-hip) enclosing a cluster of coriaceous or bony achenes. *Seeds* small, pendulous; cotyledons plano-convex; radicle superior.

ROSA LESCHENAULTIANA, W. & A. 301; F. B. I. ii. 368; Wt. Ic. t. 38.

W. Gháts, in the Nilgiri Hills above 5,000 ft., in Sholá Forest; said to occur also in the Pulney Hills.

A large climbing shrub with pink flowers, very glandular leaf-rhachises and peduncles and globose fruit, the styles

united in a long-exserted column. Bark papery, purplish-red; wood reddish-brown.

Roses, of many species and garden varieties, are to be found in cultivation, especially in the Hills.

8. **Photinia,** Lindl.

Evergreen trees or shrubs. *Leaves* simple, coriaceous, entire or toothed; stipules subulate, deciduous. *Flowers* small, white, in corymbose terminal panicles; bracts deciduous. *Calyx*-tube obconic; lobes 5, short, persistent. *Petals* 5, spreading. *Stamens* 20, inserted on the mouth of the calyx. *Ovary* half-adhering, 2-rarely more-celled; styles 2, rarely more, free or connate at the base; stigmas truncate; ovules 2 in each cell, collateral, ascending. *Fruit* a small globose or ovoid drupe with 2 pyrenes each in a crustaceous endocarp, each with 2 seeds. *Seeds* obovoid, triquetrous or compressed; testa coriaceous; cotyledons plano-convex; radicle inferior.

Leaves elliptic—ovate or—lanceolate, mucronate at apex, crenulate, 3–6 in. long, the nerves prominent beneath; flowers ·3 in. broad, the claw of the petals usually villous; seeds triquetrous ... 1. *Lindleyana.*
Leaves elliptic or obovate, obliquely acuminate at apex, entire, 3–6 in. long, 1–2·5 in. broad, nerves not prominent; flowers ·15 in. broad, the claw of the petals usually glabrous; seeds compressed ... 2. *Notoniana.*

1. PHOTINIA LINDLEYANA, W. & A. 302; F. B. I. ii. 380; Wt. Ic. t. 228.
   W. Gháts, in Shola Forests of the Nilgiri Hills at about 6,000 ft.
   A small tree with dark brown bark and light brown close-grained wood, used only for fuel.

var. *tomentosa,* Gamble. Petioles, undersurface of young leaves and inflorescence softly tawny-tomentose; leaves almost entire, serrate towards the apex.
   Nilgiris, chiefly in Sholas towards Sispara at and above 7,000 ft.

2. PHOTINIA NOTONIANA, W. & A. 302; F. B. I. ii. 380; Wt. Ic. t. 991; Ill. t. 86; Bedd. Fl. t. 192.
   W. Gháts, in the Nilgiri and Pulney hills and the hills

of Malabar and Travancore above 4,000 ft., in evergreen forests.

A good-sized tree with reddish-brown scaly bark and light red close-grained wood.

9. Cotoneaster, Rupp.

Small trees or shrubs, erect or decumbent. *Leaves* alternate, simple, usually downy beneath; stipules subulate, deciduous. *Flowers* small, solitary or in axillary or terminal cymes, white or pink; bracts and bracteoles small. *Calyx*-tube turbinate or campanulate; lobes 5, short, persistent. *Petals* 5, imbricate in bud. *Stamens* indefinite, usually 20, inserted at the mouth of the calyx. *Carpels* 2–5, adnate to the calyx-tube; styles free; stigma truncate; ovules 2 in each cell, erect. *Fruit* an ovoid globose or turbinate drupe with 2–5 1-seeded bony pyrenes. *Seeds* compressed, cotyledons plano-convex; radicle inferior.

Cotoneaster buxifolia, Wall.; F. B. I. ii. 387; W. & A. 302; Wt. Ic. t. 992.

W. Gháts, Nilgiri and Pulney Hills, above 5,000 ft.

A rigid, intricately branched shrub with elliptic-ovate acuminate apiculate small leaves, tomentose beneath, white flowers and scarlet fruit. Beddome says the hard, tough wood is used by the Todas to make clubs for killing buffaloes.

Prunus Persica, Benth. and Hook. f., the Peach; *Prunus Avium*, Linn., the Cherry; *Pyrus Malus*, Linn., the Apple; *Pyrus communis*, Linn., the Pear, are cultivated in hill stations for their fruit.

Prinsepia utilis, Royle, a thorny shrub, introduced from the Himalaya, is now found run wild in the Nilgiri Hills.

Eriobotrya japonica, Lindl., the Loquat, is occasionally cultivated in the Nilgiri Hills for its fruit.

Family LVII. SAXIFRAGACEAE.

Trees, shrubs or herbs. *Leaves* alternate with stipules adnate to the petiole or 0. or opposite exstipulate. *Flowers* usually hermaphrodite, regular. *Calyx* usually 5-merous, more or less

adnate to the ovary; lobes imbricate or valvate. *Disk* cup-like or sometimes reduced to intra-staminal glands. *Petals* usually 5, rarely 0, usually perigynous, imbricate or valvate. *Stamens* inserted with the petals, equalling or double their number, rarely indefinite. *Carpels* usually 2, less often 3–5, united in a usually 2-, rarely 3–5-celled ovary, with axile placentas, sometimes 1-celled with parietal placentas; ovules many; stigmas capitate or lateral subcapitate. *Fruit* an indehiscent capsule or an indehiscent berry. *Seeds* usually numerous, albuminous.

Placentas pendulous from the apex of the 1-celled ovary; dichotomous herbs with opposite leaves; staminodes none, stamens 5 .. 1. **Vahlia.**
Placentas parietal; scapigerous herbs with radical leaves; staminodes alternating with the 5 stamens .. .. 2. **Parnassia.**

1. Vahlia, Thunb.

Annual or biennial herbs. *Leaves* opposite, entire; stipules 0. *Flowers* small, regular, axillary, usually in pairs, white or yellowish. *Calyx*-tube hemispheric, adnate to the ovary; lobes 5, valvate. *Petals* 5, epigynous, short. *Stamens* 5, inserted on the margin of the epigynous disk; filaments subulate. *Ovary* inferior, 1-celled, with 2 pendulous placentas; ovules many; styles 2; stigmas capitellate. *Fruit* a capsule dehiscing at the apex between the styles. *Seeds* many, minute, ellipsoid, smooth.

Flowers subsessile, 2- or often 1-flowered in most of the upper axils; filaments with a small hairy scale at their base .... 1. *viscosa*
Flowers peduncled, 2- or rarely 1-flowered in most of the upper axils; filaments without a scale at their base..........2. *oldenlandioides.*

1. Vahlia viscosa, Roxb.; F. B. I. ii. 399; W. & A. 364; Wt. Ic. t. 563.
   Deccan and Carnatic, on dry lands.
2. Vahlia oldenlandioides, Roxb.; F. B. I. ii. 399; W. & A. 364; Wt. Ic. t. 562.
   Deccan and Carnatic, on sandy lands, especially near the sea.

2. Parnassia, Linn.

Glabrous, perennial, scapigerous herbs, the scapes 1-flowered, usually with a leaflike bract in the middle. *Leaves* entire,

radical, petioled. *Calyx*-tube free or adnate to the ovary; lobes 5, imbricate. *Petals* 5, white or pale yellow. *Stamens* 5, perigynous or nearly hypogynous, opposite the calyx-lobes, alternating with 5 staminodes opposite the petals; filaments subulate; anthers ovate. *Ovary* 1-celled, ovoid; style short; stigmas 3–4; ovules numerous, on parietal placentas opposite the stigmas. *Fruit* a capsule, loculicidally 3–4-valved. *Seeds* numerous, smooth, albumen scarcely any.

Scapes 6–12 in. high; leaves broadly ovate, cordate, 1–1·5 in. long; petals obovate, conspicuously fimbriate on the margins; staminodes 3–5-lobed, the lobes cylindric-clavate.......................1. *Wightiana.*
Scapes 3–6 in. high; leaves orbicular, cordate, ·5–·75 in. long; petals obovate, not or slightly fimbriate on the margins; staminodes clavate, entire or more or less 3- or even 5-lobed ....2. *mysorensis.*

1. PARNASSIA WIGHTIANA, Wall. in W. & A. 35; F. B. I. ii. 402; Wt. Ill. t. 21, Ic. t. 945.
   Boggy places on the Nilgiri plateau at 6,000–8,000 ft.
2. PARNASSIA MYSORENSIS, Heyne in W. & A. 35; F. B. I. ii. 402; Wt. Ill. t. 21.
   W. Gháts, in the Mysore, Malabar, Nilgiri and Pulney Hills, above 5,000 ft., in damp places or among rocks. The Nilgiri specimens have the staminodes more prominently lobed than those from the Pulneys. The two species are closely allied and are more distinguishable by the difference of size than by other characters.

Family LVIII. CRASSULACEAE.

Herbs, with often a woody rootstock, or undershrubs, usually succulent. *Leaves* alternate or opposite, simple or sometimes pinnate; stipules 0. *Flowers* regular, hermaphrodite or unisexual, usually in cymes. *Calyx* free, 4–5-, rarely 6–8-lobed. *Petals* as many as the calyx-lobes and alternate with them, free or connate. *Stamens* as many or twice as many as the petals, hypogynous or epipetalous. *Carpels* as many as and opposite to the petals, free or connate below, narrowed into the styles with a hypogynous scale at the base of each; ovules numerous, 2–many-seriate, rarely few. *Fruit* of usually 4–5, rarely fewer, follicles dehiscing at the ventral suture. *Seeds* many, rarely few or solitary, albuminous.

Stamens as many as the petals; leaves opposite; small herbs .... 1. **Tillaea.**

Stamens twice as many as the petals; tall erect fleshy herbs:—

Calyx with a long inflated tube and shortly 4-fid limb; corolla with a much constricted tube; leaves bulbiferous in the crenatures, opposite, sometimes pinnate .... **Bryophyllum.**

Calyx with a short tube and deeply 4-partite limb; corolla with a flask-shaped tube; leaves opposite or the upper alternate, sometimes pinnatifid, not bulbiferous .... 2. **Kalanchoe.**

1. **Tillaea,** Linn.

Small glabrous herbs. *Leaves* opposite, entire. *Flowers* minute, axillary, solitary or fascicled or cymose, white or red. *Calyx* 4–5-lobed. *Petals* 4–5, free or connate at the base. *Stamens* 4–5, filaments filiform. Hypogynous *scales* 4–5 or 0. *Carpels* 4–5, free; styles short; stigmas minute. *Follicles* 2–many-seeded, rarely 1-seeded.

TILLAEA PENTANDRA, Royle; F. B. I. ii. 412.

Deccan, in Mysore (Lobb); Nilgiris (Hohenacker), usually on walls or rocks.

A small tufted plant with angular stem, stem-clasping leaves and minute scarious flowers.

2. **Kalanchoe,** Adans.

Erect perennial herbs with stout fleshy stems and leaves. *Leaves* opposite or the upper alternate, entire crenate or pinnatifid. *Flowers* large, erect, in many-flowered paniculate bracteate cymes. *Calyx* 4-partite or 4-fid half way down, shorter than the corolla. *Petals* 4, connate in a flask-shaped corolla tube, the lobes spreading, persistent. *Stamens* 8, in 2 series, adnate to the corolla-tube. Hypogynous *scales* 4. *Carpels* 4, adnate to the base of the corolla-tube, attenuate into long subulate styles; stigmas obliquely truncate; ovules many. *Follicles* 4. *Seeds* very many, oblong-ellipsoid, ribbed longitudinally.

Calyx divided not more than half-way down; leaves obovate, nearly entire, up to 6 in. long, much narrowed at base; calyx tubular, very glandular-pubescent; flowers yellow, in elongate panicles of cymes corolla lobes ovate-oblong .... 1. *glandulosa.*

Calyx divided nearly to the base:—

Leaves simple, crenate, the crenatures broad:—

Calyx-lobes narrow, lanceolate :—

Flowers yellow, in large corymbose bracteate panicles, the inflorescence glandular or glabrous; leaves obovate-spathulate especially the upper ones, up to 4 in. long, 1 in. broad; corolla-tube in fruit shining, white .... 2. *floribunda.*

Flowers white :—

Calyx and corolla glandular-hairy; inflorescence in compact corymbs; *leaves obovate, obtuse, up to 5 in. long, 2 in. broad,* dotted with red spots (Cooke) .... 3. *olivacea.*

Calyx and corolla not glandular-hairy; inflorescence in *spreading panicles of cymes; leaves elliptic, narrowed at* base, more or less acute, up to 6 in. long, 3 in. broad, tinged with red (Cooke) .... 4. *Bhidei.*

Calyx-lobes large, ovate; leaves orbicular-obovate, cuneate at base, up to 3 in. long, 2 in. broad; flowers yellow, in compact corymbose cymes, the inflorescence glabrous; corolla-lobes obovate, mucronate .... 5. *grandiflora.*

Leaves pinnatifid, the segments, especially in upper leaves, usually narrow and even linear, sometimes broader; flowers pale yellow, in paniculate cymes with linear bracts; calyx-lobes lanceolate, *glandular; corolla-lobes oblong-lanceolate,* mucronate 6. *laciniata.*

1. KALANCHOE GLANDULOSA, Hochst.; F. B. I. ii. 414.

Deccan, in hilly country in Mysore (Wight) on dry rock soil.

A thick-stemmed succulent plant reaching 2 ft. in height.

2. KALANCHOE FLORIBUNDA, W. & A. 359; F. B. I. ii. 414.

Deccan, on dry hills in Coimbatore at 2,000–4,000 ft. (Fischer, etc.)

An erect succulent-leaved plant with glandular inflorescence.

Var. *glabra*, C. B. Clarke in F. B. I. ii. 415.

W. Gháts, on dry slopes from Mysore and N. Nilgiris to the Anamalais and hills of Travancore, at 2,000–4,000 ft.

An erect succulent, the inflorescence not glandular, and *prominently corymbose.*

3. KALANCHOE OLIVACEA, Dalz.; Cooke Bomb. Fl. i. 467.

W. Gháts, in the Anamalai Hills at Attakatti and Kadamparai, 3,500–4,000 ft. among rocks (Fischer).

An erect succulent of an olive-brown colour when fresh.

4. KALANCHOE BHIDEI, T. Cooke Bomb. Fl. i. 467.

Deccan, in the hills of Coimbatore at Dimbam and Anai-

kerai at 3,500–5,000 ft. (Fischer); Pulney Hills (Bourne). An erect succulent reaching 3 ft. high, with large flower-panicles and broad leaves.

5. KALANCHOE GRANDIFLORA, W. & A. 359; F. B. I. ii. 415; Wt. Ill. t. 111.

W. Gháts, in the Nilgiri and Pulney Hills, above 6,000 ft. A tall succulent plant with glaucous leaves and showy flowers.

6. KALANCHOE LACINIATA, DC.; F. B. I. ii. 415; W. & A. 360; Wt. Ic. t. 1158.

Deccan, on dry slopes in Coimbatore at 1,500 ft.; W. Gháts, N. slopes of Nilgiris and hills of Travancore at 3,000 ft. A large succulent herb, up to 4 ft. high.

Bryophyllum pinnatum, Kurz, an introduced plant, is found in gardens and run wild in many places in plains Districts. It is remarkable for forming new plants at the crenatures of the leaves.

Family LIX. DROSERACEAE.

Perennial glandular-hairy herbs, insectivorous. *Leaves* radical or cauline, usually entire; stipules 2. *Flowers* hermaphrodite, regular. *Calyx* 4–5- or more-partite, the sepals free, imbricate. persistent. *Petals* as many as sepals, usually hypogynous, imbricate, marcescent. *Stamens* as many as petals; filaments free or connate at the base. *Ovary* free or adherent to the base of the calyx, globose or ovoid, 1–3-celled; styles 3–5; ovules numerous, usually on parietal placentas. *Fruit* a membranous, usually loculicidal 2–5-valved capsule. *Seeds* many, albumen fleshy, embryo minute.

Drosera, Linn.

Perennial herbs with glandular hairs, sometimes with bulbous roots. *Leaves* rosulate or cauline, the glandular hairs attracting and securing small insects which they can assimilate. *Flowers* white or pink, racemose cymose corymbose or solitary. *Calyx*-lobes 4, 5 or 8, erect, marcescent. *Petals* as many as sepals, also marcescent. *Stamens* as many as petals. *Ovary* free, ovoid or globose, 1-celled; ovules many, parietal; styles 2–5. *Capsule* loculicidally 2–5-valved. *Seeds* many, obovoid-ellipsoid, testa smooth, reticulate.

Rootstock not bulbous :—
  Leaves all radical, rosulate, round-spathulate; scapes leafless; styles 5, undivided..1. *Burmanni.*
  Leaves cauline, alternate, linear; styles 3, bifid to the base
2. *indica.*
Rootstock bulbous; leaves cauline, semilunate; styles 3, short, fimbriate ....3. *peltata.*

1. DROSERA BURMANNI, Vahl; F. B. I. ii. 424; W. & A. 34; Wt. Ill. t. 20; Ic. t. 944.
   All Districts, in suitable damp places and to the highest points in the hills.
   An erect plant with leafless scapes about 4–6 in. high from the rosulate cushion of leaves at the base.
2. DROSERA INDICA, Linn.; F. B. I. ii. 424; W. & A. 34; Wt. Ill. t. 20.
   N. Circars, especially in Ganjam; Deccan, in wet places in the Hills; W. Coast, S. Canara to Travancore, in swampy places.
   A straggling leafy plant, the stems usually 3–4 in., sometimes up to 12 in. long.
3. DROSERA PELTATA, Sm.; F. B. I. ii. 424; W. & A. 34; Wt. Ill. t. 20.
   W. Ghâts, on open downs in the Nilgiri and Pulney Hills above 5,000 ft.
   An erect, pretty plant with slender stems reaching 12 in. high and over, the leaves peltate with upturned cusps. When being dried it stains the paper red.

Family LX. HALORRHAGIDACEAE.

Herbs, often aquatic. *Leaves* opposite or whorled, sometimes partly alternate, when submerged often pectinately pinnatifid; stipules 0. *Flowers* hermaphrodite or unisexual, small, axillary, solitary or fascicled, sessile or pedicelled. *Calyx*-tube adnate to the ovary, lobes usually 4. *Petals* 4, sometimes 2 or 0, valvate or slightly imbricate. *Stamens* 8, 4 or 1; anthers 2-celled, dehiscing longitudinally and laterally. *Ovary* 4-, 2- or 1-celled; ovules 4, pendulous; styles as many as cells; stigmas papillose or plumose. *Fruit* small, dry or drupaceous, 4-, 2- or 1-celled, indehiscent or separating into carpels. *Seeds* pendulous, 4 or rarely 1.

Terrestrial plants with monoecious flowers, ♂ flowers pedicelled; petals 4 in ♂ flowers; stamens 8; fruit 1-celled, 1-seeded
1. **Serpicula.**

Aquatic plants; petals 0:—

Flowers hermaphrodite or monoecious, axillary or in spikes; stamens 2–8; fruit 4-furrowed or separating into carpels; seeds 2 or 4
2. **Myriophyllum.**

Flowers unisexual, usually monoecious, axillary; stamen 1; fruit indehiscent, 4-celled; seeds 4 ....3. **Callitriche.**

1. Serpicula, Linn.

Small decumbent branching herbs. *Leaves* opposite or alternate, entire or toothed. *Flowers* monoecious, axillary, ♂ pedicelled, ♀ sessile. *Calyx*-tube adnate to the ovary; lobes 4. *Petals:* in ♂ flowers 4, cucullate; in ♀ flowers 0. *Stamens* 8, filaments filiform, anthers linear-oblong. *Ovary* 1-celled; ovules 4, pendulous; styles 4, short, stigmas plumose; in ♂ flowers pistillodes 4. *Fruit* a minute, indehiscent nut, 1-celled, 1-seeded, the enclosing calyx-tube ribbed or smooth.

Glabrous, little branching; leaves spathulate, entire or 3-toothed at apex; pedicels short, scarcely ·4 in. long; petals acute at apex; fruit glabrous, ribbed and warted ....1. *brevipes.*

Hirsute with crisped hairs, much branched; leaves obovate, 3–5-toothed at apex; pedicels long, usually ·6 to ·8 in. long; petals obtuse at apex; fruit hairy, not ribbed..2. *hirsuta.*

1. SERPICULA BREVIPES, W. & A. 338. *S. indica,* Thw.; F. B. I. ii. 431 *in part.*
   W. Ghâts, in Nilgiris and Pulneys, at 6,000–7,000 ft., in wet places.

2. SERPICULA HIRSUTA, W. & A. 338; Wt. Ic. t. 1,001. *S. indica,* Thw., F. B. I. ii. 431 *in part.*
   W. Ghâts, in the Nilgiri Hills at 6,000–8,000 ft., on banks, common.

2. Myriophyllum, Linn.

Glabrous aquatic herbs with floating stems. *Leaves* opposite or whorled, the floating ones usually linear-serrate, the submerged ones pectinately pinnatifid. *Flowers* very small, hermaphrodite or monoecious, axillary or in nearly naked spikes; ♂ very shortly

pedicelled or sessile, ♀ sessile. *Calyx* in ♂ minute, 4- rarely 2-lobed, sometimes 0; in ♀ adnate to the ovary, 4-furrowed, lobes 0 or 4 minute. *Petals* in ♂ 2 or 4, concave, sessile; in ♀ usually 0. *Stamens* 2, 4 or 8. *Ovary* of 4, rarely 2, carpels; ovules solitary, pendulous; styles short, plumose. *Fruit* 4-furrowed, separating into 4 or 2 cocci; embryo straight or curved.

Floral leaves short, up to ·5 in. long, submerged leaves long and much pectinate; fruit carpels spreading stellately, tubercled; stamens 8
1. *indicum.*

Floral leaves long, up to 1 in. long or longer, submerged leaves short, often absent; fruit carpels erect, columnar, muricate; stamens 4
2. *intermedium.*

1. MYRIOPHYLLUM INDICUM, Willd.; F. B. I. ii. 433; W. & A. 339.

E. Coast, from Ganjam southwards, in ponds and canals; W. Coast, more scarce.

A floating aquatic, with very long stems and many submerged leaves.

2. MYRIOPHYLLUM INTERMEDIUM, DC.; F. B. I. ii. 433. *M. indicum*, Wt. Ill. t. 102 *except the fruit. Haloragis oligantha*, W. & A. 338; Wt. Ic. t. 1,061.

W. Gháts, especially Nilgiris, in wet places and ponds, above 5,000 ft.

Sometimes floating, with short submerged leaves, more often rooted in mud with only the upper leaves apparent.

3. Callitriche, Linn.

Small glabrous aquatic annual herbs. *Leaves* opposite, linear or obovate-spathulate, entire, the upper ones often rosulate. *Flowers* minute, axillary, usually monoecious, solitary or sometimes one ♂ and one ♀ together; bracteoles white, membranous, caducous. *Calyx* and *petals* 0. *Stamen* 1, forming ♂ flower. *Ovary* in ♀ flower 4-celled with 4 pendulous ovules; styles 2, long, subulate. *Fruit* indehiscent, of 4 carpels combined in 2 pairs, at length separating. *Seeds* pendulous; testa membranous; albumen fleshy; cotyledons short; radicle superior.

CALLITRICHE STAGNALIS, Scop.; F. B. I. ii. 434. *C. Wightiana*, Wall.; W. & A. 339; Wt. Ic. t. 1,947.

W. Gháts, Nilgiri and Pulney Hills, in wet places and ponds about 7,000–8,000 ft.

A small flaccid herb, rooting at the nodes, the carpels narrowly winged at the margins.

Family LXI. RHIZOPHORACEAE.

Trees or shrubs. *Leaves* opposite, entire or rarely toothed; stipules interpetiolar, caducous. *Flowers* regular, usually hermaphrodite, axillary, solitary or in cymes racemes or panicles; bracteoles usually in pairs at the base of the calyx. *Calyx*-tube more or less adnate to the ovary, rarely free; lobes 4–14, valvate, persistent. *Petals* as many as the calyx-lobes and shorter than them, entire emarginate bifid or lacerate. *Stamens* usually twice as many as the petals, often in pairs opposite to them; anthers 2-celled, rarely multi-locellate. *Ovary* 2–5-celled or 1-celled by suppression of the septa; ovules usually 2 in each cell, pendulous; style simple; stigma simple or lobed. *Fruit* usually leathery, indehiscent, 1-celled, 1-seeded. *Seed* 1, pendulous, arillate or not, albumen fleshy or 0; embryo in albuminous seeds minute, in exalbuminous seeds elongate, often germinating while the fruit is on the tree.

Embryo exalbuminous, radicle large, protruded while the fruit is on the tree :—
  Bracteoles present at the base of the calyx :—
    Calyx-lobes and petals 4, entire; stamens usually 8; ovary 2-celled...1. **Rhizophora.**
    Calyx-lobes and petals 5–6, the petals more or less laciniate :—
      Stamens 10–12; ovary 3-celled...................................2. **Ceriops.**
      Stamens indefinite; ovary 1-celled................................3. **Kandelia.**
  Bracteoles absent; calyx-lobes and petals 8–14; ovary 2–4-celled 4. **Bruguiera.**

Embryo albuminous; radicle minute, not protruded :—
  Calyx-tube with bracteoles, stamens many :—
    Ovary semi-inferior, 3–5-celled, 2-ovuled in each cell; leaves coriaceous ....5. **Carallia.**
    Ovary superior, 3-celled, 2-ovuled in each cell; leaves membranous 6. **Weihea.**
  Calyx-tube without bracteoles, adnate to the base of the 3-celled ovary; leaves membranous, crenate, stamens 8...7. **Blepharistemma.**

1. Rhizophora, Linn.

Trees; branches thick, marked by leaf-scars; aërial roots descending from the stem and branches. *Leaves* opposite, coriaceous, glabrous, mucronate, entire; stipules large. *Flowers* rather large, in axillary 2–3-chotomously divided, few-flowered cymes; bracteoles connate at the base of the calyx. *Calyx* 4-lobed; lobes coriaceous, valvate. *Petals* 4, entire, inserted on a fleshy disk. *Stamens* 8–12; filaments short; anthers linear. *Ovary* 2-celled, 2 ovules in each cell; style conical, subulate; stigma bifid. *Fruit* coriaceous, 1-celled, 1-seeded, ovoid, the persistent reflexed calyx-lobes surrounding its base. *Seed* pendulous, germinating on the tree, the radicle elongate, perforating the apex of the fruit.

Leaves elliptic, long-mucronate, up to 4 in. broad; cymes 3–7-flowered on peduncles 1–1·25 in. long; petals fleshy, lanate on the faces within 1. *mucronata.*

Leaves oblong-lanceolate, short-mucronate, up to about 2 in. broad; cymes 2-flowered, on stout peduncles about ·2 in. long; petals thin, glabrous...... ....2. *Candelaria.*

1. RHIZOPHORA MUCRONATA, Lamk.; F. B. I. ii. 435; Wt. Ic. t. 238. *R. Candelaria*, W. & A. 310.
   Tidal forests on both E. and W. Coasts. The Mangrove. A glabrous evergreen tree, often appearing buttressed by the mud being washed away from the branching aerial roots, the lower part of the stem dying off; usually also sending up conical excrescences from the roots, looking like inverted tent-pegs. Bark brown, with vertical clefts, a valuable tanning material; wood dark red, very hard, an excellent fuel. Vern. *Tel.* Upoo-poma; *Tam.* Kandal.
2. RHIZOPHORA CANDELARIA, DC. *R. conjugata*, Hensl.; F. B. I. ii. 436 *not of* Linn.
   Tidal forests on both coasts; more scarce than the preceding; common in the Kistna Delta.
   A glabrous small evergreen tree, similar to *R. mucronata.* Vern. *Tam.* Kandal.

2. Ceriops, Arn.

Shrubs or small trees with aërial roots from the stem and branches. *Leaves* opposite, ovate or obovate, entire, coriaceous.

Flowers small, in short rather dense axillary cymes; bracteoles connate under the calyx. *Calyx* 5–6-lobed, the tube adnate to the ovary. *Petals* 5–6, inserted at the base of a 10–12-lobed fleshy disk; emarginate, the apex more or less ciliate. *Stamens* 10–12, inserted between the lobes of the disk; filaments slender; anthers oblong. *Ovary* semi-inferior, 3-celled, 2 pendulous ovules in each cell; style short; stigma simple. *Fruit* coriaceous, 1-celled, 1-seeded, with persistent reflexed calyx-lobes. *Seed* as in *Rhizophora*, the radicle grooved and angular.

Petals tipped with 3–4 capitate bristles........................1. *Candolleana.*
Petals tipped with many ciliae...................................2. *Roxburghiana.*

1. Ceriops Candolleana, Arn.; F. B. I. ii. 436; Wt. Ic. t. 240.
   Tidal forests of the W. Coast; Quilon in Travancore (Wight).
   A small evergreen tree with many buttresses at base and root excrescences as in *Rhizophora*. Leaves obovate, usually emarginate. Bark dark red, giving a good tanning material; wood orange-red, hard, an excellent fuel. Vern. *Mal.* An kandal.
2. Ceriops Roxburghiana, Arn.; F. B. I. ii. 436.
   Tidal forests of the E. Coast, Godavari and Kistna Deltas and elsewhere.
   A small evergreen tree similar to the preceding, the leaves obovate. Vern. *Hind.* Goran; *Tel.* Gatharu; *Tam.* Chiru kandal.

3. Kandelia, W. & A.

A small tree with aerial roots from the stem and branches. *Leaves* opposite, coriaceous, oblong, obtuse, entire. *Flowers* few, large, in axillary pedunculate dichotomously branched cymes, white; bracteoles connate round the base of the calyx. *Calyx* 5–6-lobed; tube short, adnate to the ovary; lobes linear, valvate. *Petals* 5–6, thin, bifid, the lobes multifid. *Stamens* many; filaments capillary; anthers small, oblong. *Ovary* semi-inferior, 1-celled; ovules 6, affixed in pairs to a central column; style slender; stigma 3-lobed. *Fruit* 1-celled, 1-seeded, girt with the persistent reflexed calyx-lobes. *Seed* as in *Rhizophora*.

Kandelia Rheedii, W. & A. 311; F. B. I. ii. 437; Wt. Ill. t. 89.
Tidal forests of the W. Coast; less common on E. Coast.

A small tree with pretty flowers, the pendulous radicle of the seed very slender, cylindric. Bark reddish-brown; wood soft, reddish-brown, used only for firewood. Vern. *Tel.* Thuvar kandan.

4. Bruguiera, Lam.

Trees or shrubs with aërial roots from the stem and branches. *Leaves* opposite, coriaceous, entire. *Flowers* solitary or cymose on axillary peduncles; bracteoles 0. *Calyx*-tube obconic or campanulate, coriaceous, adnate to the ovary; lobes 8–14, linear-lanceolate, valvate. *Petals* 8–14, oblong, 2-lobed or emarginate, involute, with a bristle in the sinus and others, usually 2–4, at the tip of each lobe. *Stamens* twice the number of the petals, in pairs within the petals; filaments filiform; anthers linear, mucronate. *Ovary* inferior, 2–4-celled, cells 2-ovuled; style filiform; stigma 2–4-lobed. *Fruit* 1-celled, 1-seeded, indehiscent, coriaceous, crowned with the calyx-lobes. *Seed* as in *Rhizophora.*

Flowers large, solitary, calyx-lobes erect in fruit; radicle grooved:—
Petals glabrous except at the base; leaves elliptic, acute, up to 6 in. long by 2·5 in. broad..1. *conjugata.*
Petals densely hirsute on the margins; leaves elliptic-oblong, acute or acuminate, up to 5 in. long by 2 in. broad......2. *eriopetala.*
Flowers small, in axillary cymes; calyx-lobes recurved in fruit; petals short, obtuse, slightly hairy; leaves elliptic-lanceolate, acute, up to 4 in. long, 1·5 in. broad; radicle almost terete......3. *cylindrica.*

1. BRUGUIERA CONJUGATA, Merr. in Philipp. Journ. Sc. ix. 118. *B. gymnorhiza*, Lam.; F. B. I. ii. 437; W. & A. 311; *B. Rheedii*, Bl.; Wt. Ic. t. 293A.

   Tidal forests of both coasts.

   A rather large evergreen tree with short stout grooved rugose radicle; root-excrescences frequent. *Wood* red, extremely hard, used for building and fuel. Vern. *Hind.* Kankra; *Tel.* Thuddu ponna.

2. BRUGUIERA ERIOPETALA, W. & A.; F. B. I. ii. 438; Wt. Ic. t. 239B.

   Tidal forests of Travancore on W. Coast.

   A small tree, similar to the preceding but scarce.

3. Bruguiera cylindrica, W. & A. 311. *B. caryophylloides*, Bl.; F. B. I. ii. 438; Wt. Ill. t. 210. *B. malabarica*, Arn.; F. B. I. ii. 438.

Tidal forests of West Coast (Wight); E. Coast, Kistna delta (Weld, Boileau), S. Arcot.

A small tree with dark brown bark and red close-grained wood. Vern. *Tel.* Vurada.

5. Carallia, Roxb.

Trees or shrubs. *Leaves* opposite, petioled, ovate obovate or elliptic, entire or serrulate, glabrous, shining. *Flowers* small, in short 3-chotomous axillary branching cymes; bracteoles at base of calyx minute. *Calyx*-tube campanulate; lobes 5–8, valvate. *Petals* 5–8, inserted on a crenulate disk, clawed, entire or bifid, toothed or lacerate. *Stamens* twice the number of the petals and inserted with them on the disk; anthers small. *Ovary* semi-inferior, usually 3–5-celled, ovules 2 in each cell; style subulate; stigma 3–5-lobed. *Fruit* small, globose, usually 1-celled, 1-seeded, indehiscent. *Seed* subreniform; testa granular; albumen fleshy; embryo curved.

Leaves serrulate, ovate, acuminate, shining, 4–5 in. long, 2–2·5 in. broad, petals orbicular, the margins crenately waved; stigma 3-lobed .... 1. *lucida.*

Leaves entire, obovate, obtuse or shortly acute, the margins revolute, 3–5 in. long, 2 in. broad; petals orbicular-cordate, the margins deeply lacerate; stigma 4-lobed .... 2. *integerrima.*

1. Carallia lucida, Roxb. Cor. Pl. t. 211; W. & A. 312; Wt. Ic. t. 605.

N. Circars, in the lower hills (*teste* Roxburgh).

A small evergreen tree. Vern. *Tel.* Karalli.

2. Carallia integerrima, DC.; F. B. I. ii. 439 *in part*; Wt. Ill. t. 90; Bedd. Fl. t. 193.

Deccan, hills of Cuddapah, Kambakam Hill in Chingleput (Bourne); W. Coast and W. Gháts, in evergreen forests, up to 4,000 ft.

A pretty evergreen tree, sometimes with aërial roots, the flower buds frequently covered with yellow resin. Bark dark grey, thin; wood red, hard, with a pretty silver grain, useful for carpentry. Vern. *Hind.* Kierpa; *Tel.* Karalli; *Kan.* Andipunar; *Mal.* Varanga.

6. **Weihea,** Spreng.

Trees or shrubs. *Leaves* opposite, petioled, entire or obtusely serrate. *Flowers* axillary, solitary or fascicled; bracteoles 2, connate in a cup, at length a short distance below the calyx. *Calyx*-tube shortly turbinate, adnate to the ovary; lobes 4–5, spreading, valvate. *Petals* 4–5, inserted under the margin of an obscure disk, clawed, spathulate, fimbriate. *Stamens* 16–30, inserted on the disk; filaments filiform; anthers oblong. *Ovary* superior, 3-celled, 2 pendulous ovules in each cell; style filiform; stigma 2–4-lobed. *Fruit* globose, fleshy, splitting in 3–4 valves, 3–4-celled, the cells 1–2-seeded. *Seeds* ovoid, arillate, albuminous; cotyledons flat; radicle terete.

WEIHEA ZEYLANICA, Baill.; F. B. I. ii. 441; Bedd. Fl. t. 194.
W. Gháts, in the hills of Travancore and Tinnevelly, at low elevations.
A small tree with thin ovate acuminate leaves and white flowers. Vern. *Tam.* Kanun.

7. **Blepharistemma,** Wall.

A tree. *Leaves* opposite, petioled, membranous, elliptic-oblong, acuminate, crenate. *Flowers* polygamo-dioecious, in many-flowered axillary cymes; bracteoles 0. *Calyx*-tube campanulate, adnate to the base of the ovary; lobes 4, erect. *Petals* 4, clawed, spathulate, lacerate at apex, inserted round an 8-lobed disk, the disk lobes long in ♂, shorter in ⚥. *Stamens* 8, inserted on the margin of the disk, small in ♀; filaments ciliate; anthers oblong. *Ovary* free, 3-celled, 2 ovules in each cell; style short in ♂, longer in ♀; stigma shortly 3-lobed. *Fruit* a fleshy capsule.

BLEPHARISTEMMA CORYMBOSUM, Wall.; F. B. I. ii. 441.
W. Coast and W. Gháts, from Coorg to Travancore, up to 2,500 ft., in evergreen forest.
A handsome straight-stemmed tree, in favourable situations reaching a considerable size, with white flowers and greenish-black fruit. Wood pale greenish-yellow, moderately hard. Vern. *Mal.* Nir kurunda.

Family LXII. COMBRETACEAE.

Trees or shrubs, often climbing. *Leaves* alternate subopposite or opposite, sometimes ternate, entire; stipules 0. *Flowers* hermaphrodite, rarely unisexual or polygamous, in spikes or racemes often panicled; bracteolate. *Calyx*-tube adnate to the ovary and produced above it, the limb 4–5-lobed, the lobes valvate. *Petals* 4–5 or 0, inserted on the calyx, alternate with its lobes. *Stamens* as many as, or twice as many as the calyx-lobes, in 2 series; filaments filiform or subulate; anthers usually didymous. *Ovary* inferior, 1-celled, usually crowned with a lobed disk; ovules usually 2–3, sometimes more; style subulate; stigma simple. *Fruit* coriaceous or drupaceous, generally indehiscent, angular or winged, sometimes crowned by the persistent calyx. *Seed* 1; albumen 0; cotyledons convolute plicate or plano-convex.

Petals 0:—
- Calyx-limb deciduous; erect trees or shrubs:—
  - Flowers in spikes or racemes ....1. **Terminalia.**
  - Flowers in capitate heads ....2. **Anogeissus.**
- Calyx-limb accrescent in fruit; straggling shrubs...3. **Calycopteris.**

Petals 4–5:—
- Calyx-limb persistent; leaves alternate; trees or shrubs 4. **Lumnitzera.**
- Calyx-limb deciduous; leaves opposite; climbers:—
  - Calyx-tube not or only shortly produced beyond the ovary 5. **Combretum.**
  - Calyx-tube produced more than ·5 in. beyond the ovary 6. **Quisqualis.**

1. **Terminalia,** Linn.

Trees. *Leaves* alternate or subopposite, entire or slightly crenulate, often with glands on the petiole or on the lower part of the midrib beneath; stipules 0. *Flowers* small, green or white, in spikes, the spikes solitary or in panicles; hermaphrodite or sometimes the upper flowers of the spike ♂, the lower ☿; bracteoles small, usually soon deciduous. *Calyx*-tube ovoid or cylindric, constricted above the ovary; limb campanulate with 5 triangular valvate lobes. *Petals* 0. *Stamens* 10 in 2 series, the 5 upper alternate with the calyx lobes, the 5 lower opposite them; filaments subulate, exserted; anthers small. *Disk* inside the

stamens, 5-lobed, villous. *Ovary* inferior, 1-celled; ovules 2–3, pendulous; style subulate; stigma small. *Fruit* ovoid, smooth or angular or winged with 2–5 equal or unequal wings, indehiscent. *Seed* solitary, exalbuminous; cotyledons convolute.

Fruit not winged, ovoid or subcompressed:—

Flowers in simple spikes; leaves clustered at the ends of the branchlets, alternate, obtuse:—

Leaves green, thin, obovate, base cordate, petiole very short; fruit ellipsoid, more or less compressed, 2-ridged when dry, glabrous ....1. *Catappa*.

Leaves greyish-green, thick, broadly elliptic, cuneate at base, petiole very long; fruit subglobose, very faintly 5-ridged when dry, minutely brown-tomentose .... 2. *bellerica*.

Leaves glaucous, thick, ovate, rounded or attenuate at base, obtuse or emarginate at apex, petiole short; fruit obovoid, very faintly 5-ridged when dry, glabrous ....3. *pallida*.

Flowers in simple spikes or short terminal panicles; leaves not clustered at the ends of the branchlets, opposite or subopposite:—

Fruit minutely brown-tomentose, ovoid or ellipsoid, faintly 5-ridged when dry; leaves coriaceous, ovate or ovate-oblong, tawny-pubescent, up to 5 in. long by 3 in. broad, nerves irregular; spikes densely tawny-pubescent, as are the branchlets....4. *Gella*.

Fruit glabrous, shining:—

Leaves ovate elliptic or obovate, obtuse and usually apiculate at apex, usually rounded at base, under surface glabrous to tawny-villous, up to 7 in. long by 3–3·5 in. broad, nerves regular, parallel; spikes nearly glabrous; fruit obovoid, faintly angled, up to 1·5 in. long, 1 in. in diam.................5. *Chebula*.

Leaves ovate-lanceolate, acuminate at apex, unequally attenuate or rounded at base, pubescent when young, glabrous when old, up to 4 in. long, 1–2 in. broad, nerves fairly regular; spikes slender, rusty-puberulous; fruit ovoid, covered with round spots, ·75–1·25 in. long, ·5 in. in diam....6. *travancorensis*.

Fruit with 5 equal angles or wings; flowers in panicles of spikes with linear bracteoles; leaves often more or less crenate or serrate:—

Fruit with short hard angles or wings, usually notched near the top, the lines on the wings oblique and curving upwards; leaves oblong or elliptic, usually crenulate; bark smooth.........7. *Arjuna*.

Fruit with long thin papery wings, usually rounded at top, the lines on the wings straight and horizontal.

Fruit softly and minutely yellowish brown-velvety as are the

leaves beneath twigs and inflorescence ; leaves coriaceous, elliptic-ovate or -oblong, obtuse and often emarginate at apex, unequally cordate at base with usually 1 or 2 sessile glands at the base of the midrib beneath, up to 9 in. long by 4·5 in. broad ; fruit, including wings, 1·5 in. in diam......... .. ..8. *coriacea.*

Fruit glabrous, large, usually 2 in. in diam., including wings :—

Calyx villous with yellowish-brown hairs as are the underside of the leaves, the twigs and inflorescence ; leaves coriaceous, elliptic-oblong, obtuse or even emarginate or slightly acute at apex, rounded or cordate at base, nerves many, prominently parallel, glands near the base of the midrib large and stalked, up to 7 in. long, 3 in. broad ; panicles dense ....9. *tomentosa.*

Calyx glabrous without, the leaves, twigs and inflorescence all nearly or quite glabrous ; leaves membranous or chartaceous, elliptic- or obovate-oblong, obtuse or acute at apex, narrowed at base, the nerves parallel but not prominent, glands some way up the midrib beneath, stalked, up to 7 in. long, 2·5 in. broad ; panicles lax ....10. *crenulata.*

Fruit with 3 unequal wings, 1 long and 2 short ; leaves elliptic or elliptic-oblong, acute or acuminate at apex, rounded or cordate at base, lower subopposite, upper alternate, at first rusty-puberulous, afterwards glabrescent, up to 7 in. long, 2–2·5 in. broad ; panicles with many slender spikes, the flowers small with recurved bracteoles ; fruit rusty-puberulous, the middle wing ·5 in. long.....11. *paniculata.*

1. Terminalia Catappa, Linn. ; F. B. I. ii. 444 ; W. & A. 313 ; Wt. Ic. t. 172 ; Bedd. Fl. t. 18.

Cultivated in gardens and avenues near the coast, introduced from Malaya. The Indian Almond.

A large deciduous handsome tree with large leaves, which turn red before falling, the trunk often buttressed. Wood red, hard. The nut-kernels with thin spirally folded cotyledons are eaten. Vern. *Hind.* Deshi-badam ; *Tel.* Vedam ; *Tam.* Nat vadom ; *Mal.* Adamarram.

2. Terminalia bellerica, Roxb. Cor. Pl. t. 198 ; F. B. I. ii. 445 ; W. & A. 313 *excl. syn.* ; Wt. Ic. t. 91 ; Bedd. Fl. t. 19.

Deciduous forests in all Districts, up to about 3,000 ft.

A large deciduous tree with long-petioled leaves, pubescent flowers and tomentose fruit. Bark bluish-grey with vertical cracks ; wood yellowish-grey, hard, not durable and little used, but useful if carefully seasoned. The fruit

A lofty tree with glabrous lanceolate leaves, the petiole ·75 in. long, without glands. Bark pale brown, smooth; wood pale brown, hard. Vern. *Tam.* Pei, kadakai, Morgatchie; *Mal.* Kotta kadakai.

7. TERMINALIA ARJUNA, W. & A. 314 (in note); F. B. I. ii. 447; Bedd. Fl. t. 28. *T. Berryi*, W. & A. 314.

N. Circars and Deccan, more scarce in Carnatic except in Tinnevelly and on the W. Coast, on the banks of rivers and streams, often planted.

A large and handsome deciduous tree usually with narrow oblong leaves, the stems often buttressed. Bark pinkish-grey, smooth; wood brown, variegated with darker streaks, very hard and useful. Vern. *Hind.* Arjúna; *Ur.* Arjuno; *Tel.* Yermaddi; *Tam.* Vella marda, Kula maruthu.

8. TERMINALIA CORIACEA, W. & A. 315. *T. tomentosa* var. *coriacea*, C. B. Clarke in F. B. I. ii. 448.

Deccan, on dry hills in deciduous forest, chiefly in the Ceded Districts and up to 4.500 ft. as at Horsleykonda.

A large tree in suitable localities, otherwise often stunted. noticeable for the abundant yellowish velvety down. Bark deeply cracked; wood hard, dark brown. Vern. *Tel.* Tani.

9. TERMINALIA TOMENTOSA, W. & A. 314. *T. tomentosa* var. *typica*, C. B. Clarke in F. B. I. ii. 447; Wt. Ic. t. 195 *probably*.

N. Circars, deciduous forests of Ganjam and Godavari; Deccan, in Hyderabad and Bellary.

A large tree with the under-surface of the leaves villous, also the inflorescence; the fruit large, glabrous. Bark rough, much fissured; wood as in the preceding. Vern. *Hind.* Asan, Saj; *Ur.* Sahaju; *Tel.* Tani.

10. TERMINALIA CRENULATA, Roth; W. & A. 314. *T. tomentosa*, var. *crenulata*, C. B. Clarke in F. B. I. ii. 448.

W. Coast and W. Gháts, from S. Canara southwards, up to 2,000 ft.

A large tree with nearly glabrous rather thin leaves and glabrous fruit. Bark greyish-black; wood dark brown, streaked with black, hard and useful for building and agricultural purposes. Vern. *Tam.* Karu maruthu; *Mal.* Thembava.

11. TERMINALIA PANICULATA, Roth; F. B. I. ii. 448; W. & A. 315; Bedd. Fl. t. 20.

S. Deccan, in the deciduous forests of Cuddapah and Bellary; W. Ghâts, in deciduous forests from S. Canara to Travancore, common up to 2,000 ft.

A large deciduous tree with characteristic fruit. Bark dark brown, cracked; wood pale brown, smooth, very hard, a useful building wood. Vern. *Tel.* Neemeeri; *Tam.* Pekarakai, Vem-marúthu; *Mal.* Pillai marúthu.

2. Anogeissus, Wall.

Trees or shrubs. *Leaves* alternate or subopposite, petioled, entire. *Flowers* in dense globose heads on short axillary peduncles or in short cymes; bracts on the peduncles or at the cyme branches often leafy; bracteoles minute. *Calyx*-tube slender above the ovary; limb cup-shaped with 5 lobes. *Petals* 0. *Stamens* 10, in 2 series; anthers small. *Ovary* inferior, 1-celled; ovules 2, pendulous; style subulate. *Fruits* packed in dense heads, compressed, 2-winged, ending in the persistent calyx-tube and sometimes limb. *Seed* 1; cotyledons convolute.

Leaves elliptic or suborbicular, up to 3 in. long, 2–2·5 in. broad, obtuse at apex, rounded or sometimes cordate at base; flower-heads usually in cymes; calyx-tube rather short, about ·1 in. long, lobes reflexed; fruit broadly winged, the wings rounded, entire............1. *latifolia.*

Leaves elliptic-lanceolate, up to 2·5 in. long, 1 in. broad, acute at apex, narrowed at base; flower-heads usually solitary on bracteate peduncles; calyx-tube long and slender, about ·25 in., lobes spreading; fruit fairly broadly winged with dentate wings ....2. *acuminata.*

1. Anogeissus latifolia, Wall.; F. B. I. ii. 450; Bedd. Fl. t. 15. *Conocarpus latifolia*, DC.; W. & A. 316; Wt. Ic. t. 994.

N. Circars, Deccan and Carnatic to S. Travancore, in dry deciduous forests and up to 4,000 ft.

A large deciduous tree, conspicuous by its smooth grey bark and by the leaves turning red before falling. Wood grey, hard, with a small purplish heartwood, strong and tough and useful for agricultural implements, carts, building and fuel. It gives a gum and the leaves are used in tanning. Vern. *Hind.* Bakli; *Ur.* Dohu; *Tel.* Chiriman; *Tam.* Vellay naga; *Mal.* Maru kanchiram.

var. *villosa*, C. B. Clarke. Leaves densely rusty-villous.

S. Deccan, in Mysore and N. Nilgiris.

2. Anogeissus acuminata, Wall.; F. B. I. ii. 450; Bedd. Fl. t. 16. *Conocarpus acuminata*, Roxb.; W. & A. 316.

N. Circars, from Ganjam to Godavari, usually on river banks, often cultivated,

A large deciduous tree with rough dark grey bark and drooping branches. Wood grey, shining, hard, not so good in quality as that of *A. latifolia*. Vern. *Ur.* Pasi; *Tel.* Panchman, Pansi; *Tam.* Nunnera.

3. **Calycopteris**, Lamk.

A diffuse scandent shrub. *Leaves* opposite, entire, elliptic or ovate. *Flowers* in dense axillary racemes, crowded in large panicles towards the ends of the branches. *Calyx*-tube elongate, 5-striate, produced above the ovary; limb 5-lobed, the lobes persistent, recurved or spreading, accrescent *Petals* 0. *Stamens* 10 in 2 series, short, 5 opposite to 5 alternate with the calyx-lobes; filaments subulate; anthers didymous. *Ovary* inferior, 1-celled; ovules 3, pendulous; style subulate; stigma simple. *Fruit* narrow, ovoid, 5-ribbed, 1-seeded, surmounted by the enlarged calyx. *Seed* solitary; cotyledons convolute.

Calycopteris floribunda, Lamk.; F. B. I. ii. 449. *Getonia floribunda*, Roxb. Cor. Pl. t. 87; W. & A. 315.

N. Circars and Deccan, in deciduous forests or along water-courses up to 2,500 ft.

A straggling shrub, often climbing, the wood of peculiar structure. Vern. *Ur.* Kokundia; *Tel.* Bandi murududu.

4. **Lumnitzera**, Willd.

Littoral glabrous shrubs or small trees. *Leaves* alternate, coriaceous, obovate-cuneate, entire or crenate, clustered towards the ends of the branches. *Flowers* small, in axillary or terminal racemes; bracteoles 2, on the calyx-tube. *Calyx*-tube oblong, produced above the ovary; lobes 5, persistent. *Petals* 5, oblong, spreading. *Stamens* 10, in 2 series, sometimes fewer, those of one series often wholly or partially absent. *Ovary* 1-celled, inferior; ovules 2–5, pendulous; style subulate; stigma simple. *Fruit* woody, elliptic-oblong, crowned by the persistent calyx-lobes. *Seed* solitary; cotyledons convolute.

LUMNITZERA RACEMOSA, Willd.; F. B. I. ii. 452; W. & A. 316.
E. and W. Coasts, in mangrove swamps.
An evergreen tree of shrubby growth with rather small leaves and white flowers. Bark thick, brown, rough; wood hard, greyish-brown with a darker heartwood, used for posts and as fuel. Vern. *Tel.* Kadivi, Thandara; *Tam.* Tipparathai.

5. Combretum, Linn.

Shrubs, usually straggling or climbing. *Leaves* entire, opposite, petiolate, sometimes alternate or ternate. *Flowers* polygamo-dioecious, spicate, the spikes often panicled; bracteoles small. *Calyx*-tube constricted above the ovary; limb campanulate or funnel-shaped; lobes 4–5. *Petals* as many as the calyx-lobes and inserted between them, sometimes 0. *Stamens* twice as many as the calyx-lobes, in 2 series; filaments slender; anthers small, didymous. *Ovary* inferior, 1-celled; ovules 2–5, pendulous; style subulate; stigma simple. *Fruit* dry, usually indehiscent, with 5 ridges or wings, the wings chartaceous. *Seed* usually solitary; testa membranous, protruded into the angles of the wings; cotyledons plicate, rarely convolute; radicle superior.

Flowers small, with campanulate calyx-limb and 5 calyx-lobes and petals, bracteoles linear, as long as flowers; leaves oblong, abruptly acuminate, up to 6 in. long, 2 in. broad, the transverse nervules many, horizontal, floral leaves cream-white; fruit with 5 papery wings, oblong, 1 in. long.......................................1. *decandrum.*
Flowers with 4 calyx-lobes and petals, bracteoles minute; leaves all green, transverse nervules of leaves irregular, branching:—
Calyx-tube above the ovary widely campanulate; leaves ovate to lanceolate, often nearly orbicular, pale and thin when dry, variable in size; fruit with 4 papery wings, nearly globose in outline, ·75 in. in *diam*.......................................2. *ovalifolium.*
Calyx-tube above the ovary funnel-shaped; leaves ovate to nearly orbicular with a short abrupt acumination, up to 5 in. long, 4 in. broad, coriaceous, greenish and shining when dry; fruit with 4 papery striate wings, globose in outline, 1·5 in. in diam.
3. *extensum.*

1. COMBRETUM DECANDRUM, Roxb. Cor. Pl. t. 59; F. B. I. ii. 452. *Poivrea Roxburghii*, DC.; W. & A. 317.
N. Circars, from Ganjam to Godavari, abundant in open forest land.

A large climbing shrub with white honey-scented flowers and cream-coloured conspicuous floral leaves, a troublesome *forest climber, difficult to destroy. Vern. Ur.* Atundi; *Tel.* Arikota.

2. Combretum ovalifolium, Roxb.; F. B. I. ii. 458; W. & A. 317.

N. Circars, Deccan and Carnatic, in deciduous forest, up to 2,000 ft.; W. Coast, in S. *Canara.*

A large climbing shrub with large panicles of small flowers and rather small fruit. The branches *are* used for cattle-ropes. Vern. *Tam.* Verragay.

3. Combretum extensum, Roxb.; F. B. I. ii. 458. *C. Wightianum*, Wall.; W. & A. 317; Wt. Ic. t. 227.

W. *Coast, in S. Canara* (Wight).

A large climbing shrub with large leaves *and fruit* and flowers in panicles of rather dense spikes.

6. Quisqualis, Linn.

Large straggling or climbing shrubs. *Leaves* opposite, oblong or obovate, entire. *Flowers in short* axillary or terminal spikes, white or red; bracteoles small. *Calyx*-tube produced above the ovary; limb 5-lobed. *Petals* 5. *Stamens* 10, short. *Ovary* 1-celled; ovules 3–4, pendulous; style filiform, somewhat adnate *to the calyx-tube*; stigma subcapitate. *Fruit* dry, *coriaceous*, 5-angled or 5-winged. *Seed* 1; cotyledons not convolute.

Quisqualis malabarica, Bedd. Ic. t. 155; F. B. I. ii. 460.

W. Ghâts, Carcoor Ghât in Wynaad (Beddome) at 1,500 ft.; Travancore forests at 300 ft. (Bourdillon).

A *large climbing* shrub with calyx-tube about ·5 in. long, pink petals, elliptic-ovate or -lanceolate acuminate leaves reaching 5 in. in length, the petioles hardening as rigid spines, and a *Combretum*-like 5-winged fruit about 1 in. long.

Quisqualis indica, Linn., is a large straggling or climbing shrub from the Malay Archipelago, with showy long-tubed flowers changing colour from white to orange and red, *commonly cultivated in gardens in the plains.*

Family LXIII. MYRTACEAE.

Trees or shrubs, rarely herbs. *Leaves* entire, opposite or alternate, usually with an intramarginal nerve, and dotted with pellucid glands; stipules none or minute, deciduous. *Flowers* regular, hermaphrodite or rarely polygamous, axillary or terminal, solitary or in cymes or corymbs; bracteoles usually 2, sometimes 0. *Calyx*-tube adnate to the ovary and sometimes produced above it, sometimes with a disk at the mouth; limb of 4 or 5 persistent or deciduous lobes, often closed in bud. *Petals* as many as the lobes of the calyx and alternate with them, inserted on the margin of the disk or the mouth of the calyx-tube, imbricate, sometimes connate and falling as a calyptra. *Stamens* many, inserted within the petals in one or more rows, often bent inwards in bud; anthers 2-celled, dehiscing longitudinally. *Ovary* inferior or semi-inferior, 1- or more- but usually 2-celled, with many ovules, the ovules usually axile, sometimes pendulous; style simple; stigma small. *Fruit* crowned with the calyx-limb, a berry or capsule with many seeds, sometimes only 1, by arrest. *Seeds* exalbuminous.

Leaves opposite or very rarely alternate:—
- Leaves with 3–5 ribs, very tomentose; ovary 3–6-celled, many-seeded.......................................1. **Rhodomyrtus.**
- Leaves penninerved:—
  - Calyx-limb closed in bud, the lobes in flower valvate; ovary many-celled.......................................2. **Psidium.**
  - Calyx-limb 4–5-lobed, the lobes free; ovary usually 2-celled:—
    - Calyx-tube produced beyond the ovary; flowers in cymes, the stamens bent back inwards in bud at the middle:—
      - Calyx-tube with a thickened staminal disk at the mouth; flowers usually large, the petals falling free......3. **Jambosa.**
      - Calyx-tube without a thickened staminal disk; flowers usually small, the petals falling off either free or more often as a calyptra.......................................4. **Syzygium.**
    - Calyx-tube not produced beyond the ovary; flowers solitary or fascicled or in short racemes, the stamens not bent inwards at the middle in bud, but only erect or incurved:—
      - Ovary with 2 cells and many axile ovules; flowers axillary or subterminal.......................................5. **Eugenia.**

Ovary with 2 cells, each with 4 pendulous ovules; flowers supra-axillary............... .... 6. **Meteoromyrtus.**

Leaves alternate in older plants, young leaves often different from the later and usually opposite; petals falling off as a calyptra 7. **Eucalyptus.**

1. Rhodomyrtus, DC.

Trees or shrubs. *Leaves* opposite, 3- or 5-ribbed. *Flowers* rather large, in axillary 1–7-flowered cymes; bracteoles small, deciduous. *Calyx*-tube turbinate, not or hardly produced beyond the ovary; lobes 5, persistent. *Petals* 5, spreading. *Stamens* indefinite, free, in many series. *Ovary* 1- 2- 3-celled, but appearing 2- 4- 6-celled by spurious partitions between the pairs of ovules which are arranged in vertical rows; style filiform; stigma capitate. *Fruit* a globose berry with numerous horizontal seeds. *Seed* compressed, exalbuminous, reniform or orbicular, horizontal: testa hard; embryo curved with small cotyledons and long radicle.

RHODOMYRTUS TOMENTOSA, Wt. Spic. Neilgh. t. 71; F. B. I. ii. 469. *Myrtus tomentosa*, Ait.; W. & A. 328; Wt. Ill. t. 97*3, Ic. t. 522.

Nilgiri and Pulney Hills, and southwards above 5.000 ft., on open downs, on dry slopes. Hill Gooseberry.

A thickly tomentose shrub with grey-tomentose foliage, pink flowers and pleasant fruit, much eaten on the Nilgiris Fyson says that the Pulney fruit is not so good. Bark thin, red, papery; wood dark red, close-grained, makes good walking-sticks. Vern. *Badaga* Thaontay; *Trav. Hills*, Koratta.

2. Psidium, Linn.

Trees or shrubs. *Leaves* opposite, entire, not dotted. *Flowers* large, white, on 1- or few-flowered axillary peduncles. *Calyx* urceolate or obovate, limb undivided in aestivation, separating valvately into 4–5 lobes when in flower. *Petals* 4 or 5, free. *Stamens* many, inserted in several series on a wide disk. *Ovary* many-celled, with numerous ovules in each cell; style subulate; stigma peltate or capitate. *Fruit* a globose ovoid or pyriform berry, usually crowned by the calyx-limb. *Seeds* many, sub-reniform; testa hard; embryo curved with short cotyledons and long radicle.

Psidium Guajava, Linn.; F. B. I. ii. 468.

An American plant, cultivated and run wild in most Districts. The Guava.

A small tree, much cultivated for its fruit. Bark smooth, thin, greenish-grey; wood greyish-brown. Vern. *Hind.* Amrud; *Tel.* Jama; *Tam.* Segapu; *Kan.* Sebe; *Mal.* Pela.

3. Jambosa, DC.

Trees. *Leaves* opposite, entire, pellucid-dotted, petioles short. *Flowers* large, 4-merous, jointed with the top of the pedicel, in terminal or rarely lateral cymes, the branches 3-chotomously divaricate; bracteoles 0. *Calyx*-tube more or less turbinate, usually attenuate at the base, the mouth produced beyond the ovary and furnished with a thickened staminal disk; lobes rounded, persistent. *Petals* 4, inserted on the top of the mouth of the calyx, broad, concave, obtuse, falling singly. *Stamens* very numerous, free, longer than the petals, bent inwards in the middle regularly when in bud, later unfolding. *Ovary* 2-celled, many-ovuled; style slender; stigma slightly acute. *Fruit* a 1–2-seeded fleshy berry, crowned by the calyx-limb and thickened disk. *Seeds* large, angled; cotyledons thick, fleshy; radicle small, concealed between the cotyledons.

Flowers pedicelled :—
Leaves rounded or cordate at base :—
Flowers in terminal corymbose cymes :—
Leaf-nerves and intramarginal nerve conspicuous, regular; leaves cordate at base :—
Leaves lanceolate, long-acuminate, 6–9 in. long, 1·5–2·5 in. broad; calyx-tube slender, ·5–·75 in. long; fruit 1·5 in. in diam. .... 1. *Munronii.*
Leaves elliptic-oblong, acute or obtuse, 6–9 in. long, 3–3·5 in. broad; calyx-tube stout, ·4 in. long; fruit 1 in. in diam. 2. *Mundagam.*
Leaf-nerves and intramarginal nerve not conspicuous, the latter irregular and often double; leaves elliptic, obtusely acute, rounded at base, 3–4·5 in. long, 1·5–2·5 in. broad; calyx-tube thick, subcylindric, ·5 in. long .... 3. *courtallensis.*
Flowers in lateral cymes on the old wood; leaves elliptic-ovate or -lanceolate, long acuminate, the nerves and intramarginal

nerve very conspicuous, 4–7 in. long, 2–4 in. broad; calyx-tube short, thick; fruit 1·5 in. in diam., spherical......4. *Rama-Varma.*

Leaves narrowed at base; flowers in terminal corymbose cymes:—

Leaves elliptic or ovate:—

Leaf-nerves and intramarginal nerve somewhat obscure:—

Leaves ovate or elliptic, bluntly acuminate, 2·5 in. long, 1–2 in. broad; calyx-tube slenderly funnel-shaped below, suddenly broadening above, about ·75 in. long; fruit ovoid, 1 in. in diam.......................................5. *laeta.*

Leaves elliptic, acute to caudate-acuminate, 3–7 in. long, 1–3 in. broad; calyx-tube shortly and stoutly obconic, about ·4 in. long; fruit hemispherical, 1 in. in diam.

6. *hemispherica.*

Leaf-nerves and intramarginal nerve prominent; leaves narrowly elliptic-oblanceolate, acuminate at both ends, the apex blunt, 3–4·5 in. long, 1–1·5 in. broad; calyx-tube campanulate, later hemispheric, ·2 in. long; fruit apparently small

7. *Bourdillonii.*

Leaves linear or lanceolate, acuminate at both ends:—

Leaves 1·5–2 in. broad, the nerves and intramarginal nerve fairly prominent; calyx-tube funnel-shaped, ·5 in. long; fruit globose, 1–2 in. in diam. ....8. *vulgaris.*

Leaves ·5–·75 in. broad, the nerves and intramarginal nerve faint; calyx-tube very slender at base, broadly turbinate above, ·7 in. long; fruit globose, ·75 in. in diam... 9. *occidentalis.*

Flowers sessile; leaves broadly ovate, very coriaceous, obtuse at apex, shining, nerves and intramarginal nerve prominent but irregular, 4–5 in. long, 3 in. broad; calyx-tube narrowed below....10. *Beddomei.*

1. Jambosa Munronii, Walp. *Eugenia Munronii*, Wt.; F. B. I. ii. 472; Wt. Ic. t. 546.
   W. Gháts, from S. Canara southwards, up to 5,000 ft., in evergreen forests.
   A handsome tree with large reddish or white flowers and purplish-green fruit. Vern. *Tam.* Ilambili.

2. Jambosa Mundagam, Gamble n. comb. *Eugenia Mundagam*, Bourd. For. Trees Trav. 182.
   W. Gháts, in the evergreen forests of Travancore, up to 4,000 ft.
   A medium-sized tree with white fragrant flowers. Bark smooth, brown; wood brown, rough, used for posts. Vern. *Tam.* Katta samba; *Mal.* Mundagam.

3. JAMBOSA COURTALLENSIS, Gamble in Kew Bull., 1918, 239.
W. Gháts, hills of Tinnevelly (Wight).
A tree.

4. JAMBOSA RAMA-VARMA, n. comb. *Eugenia Rama-Varma*, Bourd. in Ind. For. xxx, 147. t. 2.
W. Gháts, in the evergreen forests of Travancore and Tinnevelly, above 4,000 ft.
A medium-sized rare tree with white flowers, large leaves and greenish-pink fruit.

5. JAMBOSA LAETA, Bl. *Eugenia laeta*, Ham.; F. B. I. *ii.* 479. *E. pauciflora*, Wt. Ic. t. 526.
W. Gháts, in evergreen forests from S. Canara southwards, up to 4,000 ft.
A medium-sized pretty tree with rather small leaves, white petals and very long crimson stamens. Bark smooth, white; wood brownish-grey, hard.

6. JAMBOSA HEMISPHAERICA, Walp. *Eugenia hemispherica*, Wt.; F. B. I. ii. 477; Wt. Ic. t. 525; Bedd. Fl. t. 203.
W. Gháts, from S. Canara southwards, up to 3,000 ft., in evergreen forests.
A large tree with white or rose-coloured flowers and purple fruit. Bark smooth, blackish; wood brown, hard. Vern. *Tam.* Vellei nyaral; *Mal.* Ven nyára.

7. JAMBOSA BOURDILLONII, Gamble in Kew Bull., 1918, 239.
W. Gháts, hills of Travancore at 2,000 ft. (Bourdillon).
A medium-sized tree.

8. JAMBOSA VULGARIS, DC. W. & A. 332; Wt. Ic. t. 435. *Eugenia Jambos*, Linn.; F. B. I. ii. 474.
Cultivated in gardens and sometimes found run wild—chiefly on old cultivations. The Rose-apple.
A small pretty tree with greenish-white flowers and pinkish-white fruit, edible but not very good. Vern. *Hind.* Gulab jaman.

9. JAMBOSA OCCIDENTALIS, Gamble n. comb. *Eugenia occidentalis*, Bourd. in Ind. For. xxx. 195, t. 3.
W. Gháts, banks of the Periyar river and elsewhere, always near water.
A small handsome bushy tree with large white flowers, numerous stamens and greenish-pink globose fruit. Vern. *Tam.* Atta sámba.

10. Jambosa Beddomei, Gamble n. comb. *Eugenia Beddomei*, Duthie in F. B. I. ii. 476.

W. Ghâts, hills above Trichnagudi, S. Tinnevelly, at 4,000–5,000 ft. (Beddome).

A large tree with characteristic very coriaceous leaves and flowers in subterminal corymbs.

4. **Syzygium,** Gaertn.

Trees or shrubs. *Leaves* opposite, entire, glabrous, often pellucid-dotted. *Flowers* small, in terminal axillary or lateral cymes, usually corymbose; bracteoles small, deciduous or 0. *Calyx*-tube turbinate or funnel-shaped, the limb 4- rarely 5-lobed; no thickened staminal disk. *Petals* 4–5, rounded, concave, usually falling off as a calyptrate lid, sometimes singly. *Stamens* very numerous, free, bent inwards at the middle when in bud. *Ovary* 2-celled, with several ovules in each cell; style 1; stigma simple. *Fruit* a 1-celled, 1- or few-seeded berry, globose pyriform or oblong, crowned by the calyx-limb. *Seeds* globose; cotyledons fleshy; radicle small, concealed between the cotyledons.

Cymes terminal and axillary, rarely from leafless axils :—

Petals usually free, though deciduous :—

Calyx-tube short, turbinate; leaves coriaceous, the nerves close together :—

Leaves with petioles ·5 in. long, elliptic, caudate-acuminate at apex, acute at base, olive-green when dry, 2–3 in. long, 1–1·5 in. broad; flowers in dense cymes of umbellules, the branches tetragonus, buds ·2 in. long; fruit oblong, ·5 in. long
1. *Arnottianum.*

Leaves with petioles about ·5 in. long, oblanceolate, obtuse at apex, cuneate at base, purplish when dry, ·75–1·25 in long, ·5 in. broad; flowers in terminal corymbose cymes of umbellules, the branches tetragonous, buds ·1 in. long............2. *Myhendrae.*

Leaves sessile, ovate, obtusely acute at apex, cordate at base, nearly black when dry, 1·5–2·5 in. long, 1–1·25 in. broad; flowers in corymbs of umbellules 2·5 in. long, the branches tetragonous, buds ·1 in. long...............3. *Benthamianum*

Calyx-tube elongate, funnel-shaped; leaves chartaceous or coriaceous, the nerves not always close together :—

Flowers usually in short rather few-flowered axillary racemes; calyx-tube ·3–1 in. long; leaves elliptic or elliptic-oblong, acute to long-acuminate at apex, 3–5 in. long, 1–1·5 in. broad,

the nerves rather close and parallel; petals often many; fruit ·5 in. long, scarlet..4. *Wightianum.*

Flowers in many-flowered terminal and axillary panicles of umbellules; calyx-tube under ·3 in. long, greyish and gland-dotted:—

Leaves ovate, long-acuminate, up to 4 in. long, 1·5 in broad, usually rounded at base, petiole ·1–·2 in. long; flower pedicels short, slender; fruit ·2 in. in diam.................5. *zeylanicum.*

Leaves linear-lanceolate, acuminate, up to 3 in. long, ·5 in. broad, narrowed at base, petiole ·5 in. long; flower pedicels elongate, slender..6. *lineare.*

Flowers in umbels of 5–10 at the ends of the branchlets; calyx-tube resinous-scaly, about ·2 in. long, the lobes minute; leaves elliptic-oblong, obtuse, narrowed at base, ·3–·5 in. long, ·2 in. broad, petiole ·1 in. long; pedicels very short...7. *microphyllum.*

Petals usually falling in one piece, calyptrate:—

Cymes terminal, more or less corymbose, sometimes also axillary to upper leaves:—

Branchlets tetragonous; flowers small; calyx-tube scarcely ·1 in. in diam., turbinate:—

Leaves very coriaceous, elliptic to obovate or even orbicular, up to 6 in. long, 3 in. broad, nerves distant and prominent, but scarcely parallel, petiole very short, thick; inflorescence branches stout; fruit small, globose...............8. *montanum.*

Leaves coriaceous, ovate-lanceolate, caudate-acuminate, up to 3 in. long, 1–1·5 in. broad, nerves close and parallel, petiole very short; inflorescence branches slender; fruit small, globose ....9. *rubicundum.*

Branchlets terete:—

Leaves more than 1 in. broad:—

Leaves membranous, elliptic-ovate or -lanceolate, caudate-acuminate, green when dry, up to 3·5 in. long, 1·5 in. broad, petiole slender, nerves parallel, close and regular; inflorescence branches slender, divaricate nearly at right angles 10. *Gardneri.*

Leaves coriaceous, obovate, obtuse or emarginate, dark brown when dry, up to 4 in. long, 1·5 in. broad, petiole very short, stout, nerves parallel, reticulate between them; inflorescence branches moderately thick, ascending 11. *caryophyllaeum.*

Leaves less than 1 in. broad:—

Leaves suborbicular or obovate, often slightly emarginate,

very coriaceous, up to 1 in. long, ·75 in. broad, the nerves close; flowers in close terminal corymbs; calyx-tube ovoid, ·15 in. long; fruit oblong or obovoid, up to ·5 in. long
12. *calophyllifolium.*

Leaves obovate, abruptly obtusely acuminate at apex, cuneate at base, coriaceous, prominently glandular, up to 2 in. long, ·75 in. broad, the nerves somewhat distant; flowers in lax terminal and axillary cymes; calyx-tube funnel-shaped, ·35 in. long.. ....13. *palghatense.*

Cymes mostly axillary, occasionally terminal :—

Peduncles 2–4 in. long, their branches also long, ascending; leaves chartaceous, ovate, obtuse, narrowed at base and decurrent on the ·75 in. long petiole, 3–4 in. long, 2–2·5 in. broad; nerves few, distant, irregular, joining in loops only; flower buds small, scarcely ·1 in. in diam.............14. *travancoricum.*

Peduncles nearly 1 in. long, their branches stout, divaricating at right angles; leaves elliptic, usually abruptly acuminate at apex, narrowed at base, up to 6 in. long, 2·5–3·5 in. broad, long-petioled, nerves many, parallel, joining in an intramarginal nerve; flower-buds rather large, about ·25 in in diam.
15. *Chavaran.*

Cymes lateral, usually from the scars of fallen leaves, sometimes also axillary :—

Leaves alternate, suborbicular or ovate, very coriaceous, large, reaching 8 in. long or longer, 6 in. broad; flowers in cymes with divaricating branches, the calyx-mouth ·2 in. in diam. petals calyptrate; fruit nearly spherical, about ·5 in in diam.
16. *alternifolium.*

Leaves opposite :—

Petals free; leaves obovate to obcordate, thin, pale on both sides, nearly glaucous beneath, the nerves distant, meeting in loops only; flowers very small in very short branching cymes; fruit spherical, ·25 in. in diam........17. *malabaricum.*

Petals united, calyptrate :—

Nerves of leaf irregular, distant, anastomozing near the margin, but not producing a clearly marked intramarginal nerve :—

Branchlets terete, pale; leaves broadly obovate, often nearly orbicular, subcoriaceous, 3–8 in. long, 2–4 in. broad; inflorescence 2–2·5 in. long, the branches rather stout; fruit globose or ovoid, ·25–·5 in. in diam.
18. *operculatum* var. *obovatum.*

Branchlets tetragonous, dark; leaves elliptic or elliptic-oblong, membranous, 4–6 in. long, 2–3 in. broad; inflorescence about 4 in. long, the branches slender, angled. 19. *Stocksii.*

Nerves of leaf joining in a distinct intramarginal nerve:—

Large tree; leaves over 1 in. broad, variable in shape but usually 3–6 in. long, usually acuminate, sometimes abruptly, the nerves close and parallel; flowers somewhat large, the mouth of the calyx-tube ·2 in. in diam.; fruit oblong ellipsoid or globose............20. *Jambolanum.*

Shrub or small tree; leaves narrow, oblong, 3–4 in. long, under 1 in. broad, the nerves close but slightly irregular; flowers small, the mouth of the calyx-tube about ·1 in. in diam.; fruit obovoid, ·5 in. long, crowned with the cup-like calyx-limb...............21. *Heyneanum.*

1. SYZYGIUM ARNOTTIANUM, Walp. *S. densiflorum*, Wall.; W. & A. 329. *Eugenia Arnottiana*, Wt.; F. B. I. ii. 483; Wt. Ic. t. 999.

W. Gháts, in Shola forests of the Nilgiris, Anamalais, Pulneys and Travancore Hills, at high levels, rarely lower than 5,000 ft.

A large tree with red young leaves and buds, cream-coloured flowers and dark purple fruit. Bark grey rough; wood greyish-brown, hard and close-grained; useful for building and fuel; one of the most important of the hill woods. Vern. *Tam.* Navál, Nagay; *Mal.* Ayri.

2. SYZYGIUM MYHENDRAE, Gamble n. comb. *Eugenia Myhendrae*, Bedd. MS.; Brand. Ind. Trees, 325.

W. Gháts, in the evergreen forests of Travancore and Tinnevelly, at 3,000–4,000 ft. (Beddome, Bourdillon).

A medium-sized handsome tree reaching 40 ft. in height, the flowers white, very small, the leaves small.

3. SYZYGIUM BENTHAMIANUM, Gamble n. comb. *Eugenia Benthamiana*, Wt. *E. Arnottiana* var. *Benthamiana*, Duthie in F. B. I. ii. 484.

W. Gháts, in the Nilgiri Hills, at Sispara, 6,000 ft. (Gardner). Apparently a small tree or large shrub.

4. SYZYGIUM WIGHTIANUM, Wall.; W. & A. 330. *S. lanceolatum*, W. & A. 330. *Eugenia Wightiana*, Wt.; F. B. I. ii. 485; Wt. Ic. t. 529. *E. lanceolata*, Lam.; Wt. Ic. t. 530.

W. Gháts, in the Nilgiri, Pulney and Travancore Hills, at 2,000–4,000 ft.

A moderate-sized tree, with white flowers and scarlet fruit, showy when in full flower and fruit.

5. SYZYGIUM ZEYLANICUM, DC.; W. & A. 330; Wt. Ic. t. 73. *Eugenia zeylanica*, Wt.; F. B. I. ii. 485.

W Gháts, from S. Canara to Travancore, in the lower country, on the banks of streams.

A handsome little tree with white flowers and edible white fruit. Vern. *Mal.* Pula.

6. SYZYGIUM LINEARE, Wall. *Eugenia linearis*, Duthie in F. B. I. ii. 486. *E. zeylanica*, Bedd. Fl. t. 202.

W. Gháts, in the S. Tinnevelly Hills, on river beds up to 3,500 ft.

A small tree, with white flowers.

7. SYZYGIUM MICROPHYLLUM, Gamble n. comb. *Eugenia microphylla*, Bedd.; F. B. I. ii. 505.

W. Gháts, in S. Travancore, on river banks, at 4,000–5,000 ft. (Beddome).

A small much-branched tree with very small leaves.

8. SYZYGIUM MONTANUM, Gamble n. comb. *Eugenia montana*, Wt. Ic. t. 1060; F. B. I. ii. 488.

W. Gháts, Shola forests of the Nilgiri Hills, above 5,000 ft., common.

A large evergreen tree with small white flowers in terminal corymbs, large leaves and purple fruit. Bark brown, granulated and peeling off in small flakes; wood greyish-brown, moderately hard, used for building. Vern. *Badaga*, Poo nagay.

9. SYZYGIUM RUBICUNDUM, W. & A. 330. *Eugenia rubicunda*, Wt.; F. B. I. ii. 495; Wt. Ic. t. 538. *E. lissophylla*, Duthie in F. B. I. ii. 488.

W. Gháts, in the Nilgiri Hills (G. Thomson), south to Tinnevelly and Travancore, up to 3,000 ft. in evergreen forests.

A medium-sized tree with rough branchlets, narrow leaves and small fruit. Bark thin, smooth, pale brown; wood reddish-brown, rough.

10. SYZYGIUM GARDNERI, Thw. *Eugenia Gardneri*, Duthie in F. B. I. ii. 489. *E. cymosa*, Lam. var. *rostrata*, Duthie in F. B. I. ii. 482.

W. Ghâts, in the Anamalai, Travancore and Tinnevelly Hills, up to 4,000 ft. in evergreen forests.

An enormous tree with slender branchlets, caudate leaves, white flowers and purple fruit. Bark smooth, white; wood dark reddish-brown with yellow patches, used for building in Travancore. Vern. *Tam.* Nir navál; *Mal.* Kari nyaral.

11. SYZYGIUM CARYOPHYLLAEUM, Gaertn.; W. & A. 329. *Eugenia caryophyllaea,* Wt.; Wt. Ic. t. 540; F. B. I. ii. 490.

W. Coast and W. Ghâts from S. Canara southwards, up to 5,000 ft., especially near streams.

A small tree with white flowers and black globose fruit. Bark smooth, grey; wood brown, rather soft. Vern. *Mal.* Nyára.

12. SYZYGIUM CALOPHYLLIFOLIUM, Walp. *Eugenia calophyllifolia,* Wt.; Wt. Ic. t. 1,000; F. B. I. ii. 494.

W. Ghâts, Shola forests of the Nilgiris above 6,000 ft., common and conspicuous.

A large evergreen tree with a rounded head, small leaves, white flowers and dark purple fruit. Bark thick, brown, rough; wood reddish-brown, hard and useful for building.

13. SYZYGIUM PALGHATENSE, Gamble in Kew Bull. 1918, 240.

W. Ghâts, in the Palghat Hills of Malabar at 5,000 ft. (Beddome).

A large tree with conspicuously glandular leaves and long calyx-tube.

14. SYZYGIUM TRAVANCORICUM, Gamble in Kew Bull. 1918, 240.

W. Coast, in swampy places in the low country of Travancore, up to 200 ft. (Bourdillon).

A medium-sized or large tree with long-petioled leaves and small flowers in long-pedunculate corymbose axillary cymes.

15. SYZYGIUM CHAVARAN, Gamble n. comb. *Eugenia Chavaran,* Bourd. For. Trees Trav. 188.

W. Ghâts, evergreen forests of N. Travancore at low elevations (Bourdillon).

A very large handsome tree with rather large white flowers, usually in axillary cymes, and large closely-nerved leaves. Wood useful, the trunks sometimes hollowed into boats. Vern. *Mal.* Chavaran.

16. Syzygium alternifolium, Walp. *Eugenia alternifolia*, Wt.; Wt. Ic. t. 537; F. B. I. ii. 497; Bedd. Fl. t. 198.

Deccan, in the hills of Kurnool, Cuddapah and N. Arcot.

A large tree with large alternate or subopposite leaves, yellowish-white scented flowers and globose fruit. The wood is dark red, hard and close-grained, and is in considerable demand for building purposes. Vern. *Tel.* Manchi moyadi, Mogi.

17. Syzygium malabaricum, Gamble n. comb. *Eugenia malabarica*, Bedd. Fl. t. 199; F. B. I. ii. 497.

W. Gháts, in the Wynaad forests of Malabar at 2,000–4,000 ft., generally in swampy places.

A medium-sized tree with very small flowers in short lateral cymes and small globose fruit, the leaves pale when dry.

18. Syzygium operculatum, Gamble n. comb. *Eugenia operculata*, Roxb.; F. B. I. ii. 498; Wt. Ic. t. 552. *E. cerasoides*, Roxb.; Wt. Ic. t. 615.

Var. *obovatum*. *E. operculata* var. *obovata*, Duthie in F. B. I. ii. 498.

N. Circars, forests of Gumsúr.

A moderate-sized tree of rather dry grassy localities, usually in or near the Sál forests, the leaves turning red in the cold season, the flowers greenish, the fruit purple small and edible. Bark grey or light brown; wood reddish-grey. Vern. *Hind.* Piaman.

19. Syzygium Stocksii, Gamble n. comb. *Eugenia Stocksii*, Duthie in F. B. I. ii. 498.

W. Gháts, Wynaad forests about 3,000 ft. (Beddome).

A large tree with small flowers in axillary as well as lateral corymbose cymes.

20. Syzygium Jambolanum, DC.; W. & A. 329. *Eugenia Jambolana*, Lam.; F. B. I. ii. 499; Wt. Ic. t. 535; Bedd. Fl. t. 197. *E. caryophyllifolia*, Lam.; Wt. Ic. t. 553.

All forest Districts, both in the plains and in the hills up to 6,000 ft., usually along river banks and in moister localities, but found even on coast sands on the one side and in W. Ghát Sholas on the other. Often cultivated in avenues and topes and for its fruit.

A large evergreen tree with white flowers and purple fruit,

the latter in cultivation oblong and edible, good in tarts and puddings, in a wild state usually small and more or less globose. Bark smooth, light grey; wood hard, reddish-grey, useful for building and agricultural purposes. Vern. *Hind.* Jaman; *Ur.* Jamo; *Tel.* Neredu; *Tam.* Naval; *Kan.* Narala; *Mal.* Naga.

var. *axillare*, leaves thin, obovate, abruptly acuminate; flowers small, in axillary or lateral cymes; fruit globose, ·2 in. in diam.

W. Ghâts, lower hills of Travancore, in evergreen forests (Bourdillon).

21. SYZYGIUM HEYNEANUM, Wall. *Eugenia Heyneana*, Duthie in Fl. Br. Ind. ii. 500. *E. salicifolia*, Grah.; Wt. Ic. t. 539.

N. Circars and Deccan, in river-beds and along streams, westwards to Coorg, also in S. Travancore.

A large shrub or small tree with white flowers and narrow leaves.

5. Eugenia, Linn.

Trees or shrubs. *Leaves* opposite, entire, pellucid-dotted. *Flowers* moderate-sized, solitary or in fascicles or short cymes, axillary or terminal; bracteoles 2, below the calyx-tube, usually persistent. *Calyx*-tube nearly globose, not produced beyond the ovary, the limb of 4, rarely 5, persistent lobes; staminal disk, if present, broad. *Petals* 4, rarely 5, distinct. *Stamens* numerous, distinct. *Ovary* 2-celled, the cells often again divided by false partitions, ovules several in each cell; style slender; stigma simple. *Fruit* a nearly globose, 1- or 2-celled berry, crowned with the calyx-lobes. *Seeds* 1–2, large; cotyledons thick, partially combined; radicle very minute, scarcely distinguishable.

Young parts and inflorescence fulvous- or silvery-pubescent:—
  Staminal disk broad:—
    Leaves large, elliptic or obovate or suborbicular, very coriaceous, 3–5 in. long, 2–3·5 in. broad, floccose near the base when young like the innovations; flowers large, tawny-velvety, about 1 in. in diam., solitary or in short few-flowered terminal cymes; fruit about ·5 in. in diam., densely tomentose........................1. *floccosa*.
    Leaves usually under 3 in. long:—
      Flowers on fairly long pedicels; leaves coriaceous:—
        Pedicels solitary, ·5–1 in. long, axillary or lateral among the leaves; leaves oblanceolate, obtuse, 1–2 in. long, ·75 in. broad,

the margins revolute, nerves obscure; fruit 2 in. in diam., rusty-tomentose .... 2. *Jossinia.*
Pedicels about 1 in. long, in axillary pairs on a short peduncle; leaves elliptic to obovate, acute, 2·5–4 in. long, 1–1·25 in. broad, nerves rather prominent beneath with reticulation between; fruit about ·5 in. in diam., glabrous...3. *calcadensis*
Pedicels ·3 in. long, in pairs on the young branchlets below the leaves; leaves obovate, obtusely abruptly acuminate at apex, acutely attenuate at base, the margins decurrent, 1·5–2·5 in. long, ·75–1·25 in. broad, nerves slender, not prominent.. 4. *discifera.*
Flowers in nearly sessile clusters; leaves ovate to orbicular, obtuse or retuse, shining, 1·5–2·5 in. long, 1–1·75 in. broad, nerves few, distant, prominent; fruit globose, grey-tomentose, ·25 in. in diam.................................... 5. *codyensis.*
Staminal disk not enlarged:—
Flowers fascicled in the leaf-axils or in very short cymes:—
Leaves coriaceous, narrowly oblanceolate, obtusely acuminate at apex, the base acuminate, margin recurved, 1–2 in long, ·25–·5 in. broad, nerves very oblique, not prominent; peduncles filiform, ·3–·5 in. long, fascicled .... 6. *Rottleriana.*
Leaves subcoriaceous, elliptic or ovate, obtusely acute, narrowed at base, margins recurved, 1·5–2·5 in. long, ·75–1·25 in. broad, nerves obscure, peduncles rusty-villous, fascicled cymose or sometimes solitary, about ·4 in. long; fruit globose, glabrous, about ·4 in. long.................................. 7. *bracteata.*
Flowers solitary in the leaf-axils; pedicels ·5–1 in. long; leaves short-petioled, lanceolate, long-acuminate, rounded at base, silvery-pubescent beneath, 4–5 in. long, ·75–1·25 in. broad, nerves prominent, rather distant, at right angles to midrib; fruit globose, shortly appressed-pubescent, about ·6 in. in diam. . 8. *argentea.*
All parts glabrous or nearly so:—
Leaves ovate, caudate-acuminate, rounded or acute at base, up to 2·5 in. long, 1 in. broad, petiole ·2 in. long, slender; flowers solitary or in pairs, axillary or lateral, pedicels slender, ·3 in. long, fruit globose, glabrous, ·5 in. in diam.............................9. *Mooniana.*
Leaves ovate, obtusely acute or retuse, cordate at base, up to 3 in long, 2 in. broad, petiole very short, thick; flowers in short terminal crowded racemes, slightly pubescent ....10. *singampattiana.*

1. Eugenia floccosa. Bedd. Fl. t. 200; F. B. I. ii. 501.
W. Ghâts, in the S. Tinnevelly Hills at 3,000–4,000 ft. (Beddome).

A good-sized tree with white flowers, very velvety on the petals, large leaves and tomentose fruit.

2. Eugenia Jossinia, Duthie in F. B. I. ii. 500. *Jossinia indica*, Wt.; Wt. Ic. t. 523.
W. Gháts, in the Sivagiri and Courtallum Hills of Tinnevelly.
A small tree or shrub.

3. Eugenia calcadensis, Bedd. Ic. t. 162; F. B. I. ii. 502.
W. Gháts, Nilgiris at Sispara, Silent Valley in Malabar at 3,000 ft., Calcad Hills of S. Tinnevelly at 2,000 ft. (Beddome).
A very pretty little tree with showy white flowers in pairs.

4. Eugenia discifera, Gamble in Kew Bull. 1918, 239.
W. Gháts, hills of Travancore near Chimunji at 4,000 ft. (Bourdillon).
A small tree, the disk of the flowers broad and conspicuous.

5. Eugenia codyensis, Munro; F. B. I. ii. 501.
W. Gháts, from Coorg and S. Canara to Nilgiris and Travancore, in evergreen forests, at about 3,000 ft.
A shrubby little tree with greenish-white flowers.

6. Eugenia Rottleriana, W. & A. 331; F. B. I. ii. 502; Wt. Ic. t. 100.
W. Gháts, in the evergreen forests of Tinnevelly and Travancore at 4,000 ft.
A pretty little tree with small flowers.

7. Eugenia bracteata, Roxb.; F. B. I. ii. 502; W. & A. 331; Wt. Ill. t. 13. *E. Willdenowii*, Wt.; Wt. Ic. t. 545.
E. Coast, common on coast sandhills and in evergreen scrub forest from the Chilka Lake southwards; often cultivated in gardens.
A shrub, resembling myrtle, with pretty white flowers and red berries. Bark yellowish-grey, smooth; wood grey, hard, close-grained. Vern. *Ur.* Sagarabatna; *Tel.* Arivita; *Tam.* Kaya.

8. Eugenia argentea, Bedd.; F. B. I. ii. 503.
W. Gháts, in the Wynaad forests of Malabar at 3,000 ft. (Beddome).
A shrub or small tree with silvery leaves and conspicuous filiform bracteoles under the calyx-tube.

9. Eugenia Mooniana, Wt.; Wt. Ic. t. 551; F. B. I. ii. 505.
W. Gháts, from S. Canara southwards, at 2,000–4,000 ft.

A small tree with white flowers and globose crimson fruit.

10. Eugenia singampattiana, Bedd. Ic. t. 273; F. B. I. ii. 506.
W. Gháts, in the Singampatti Hills of Tinnevelly at 3,000 ft., in moist forests.
A small dense tree with white flowers.

6. **Meteoromyrtus,** Gamble.

Small tree or shrub. *Leaves* opposite, membranous, penninerved, villous when young. *Flowers* small, solitary, on axillary or supra-axillary pedicels, villous; bracteoles 2, linear, below the calyx-tube and longer than it. *Calyx*-tube short, not produced beyond the ovary, furnished with an annular disk at the mouth; lobes 4, lanceolate, villous, rather longer than the petals. *Petals* 4, suborbicular, pellucid-punctate. *Stamens* indefinite, inserted in a ring on the disk; anthers small, opening longitudinally. *Ovary* 2-celled, about 4-ovuled in each cell, the ovules pendulous from its apex; style elongate; stigma subcapitate. *Fruit* not yet known.

Meteoromyrtus wynaadensis, Gamble in Kew Bull. 1918, 241. *Eugenia wynaadensis*, Bedd. Ic. t. 161; F. B. I. ii. 506.
W. Gháts, about Devala in S.E. Wynaad, at 2,000–3,000 ft.
A small tree or large shrub with oblong, lanceolate, acuminate leaves, villous when young, afterwards glabrous, the rather distant nerves meeting in a looped intramarginal nerve; flowers on slender pedicels usually supra-axillary, with long linear bracteoles and lanceolate calyx-lobes, the petals pellucid-punctate and ciliate.

7. **Eucalyptus,** L'Hér.

Trees. *Leaves* usually opposite when young, when old different in shape and usually alternate, coriaceous, entire, penninerved. *Flowers* on axillary peduncles, solitary or in umbels or heads of 3–many; bracts deciduous. *Calyx*-tube turbinate or campanulate, adnate at the base to the ovary, truncate at apex, sometimes with very small lobes. *Petals* 5, united in a calyptra which falls off by the pressure of the growing stamens. *Stamens* many, free, many-seriate; filaments filiform; anthers small. *Ovary* inferior, 3–4-celled; many ovules in each cell, subhorizontal; style slender;

stigma small. *Fruit* a hardened capsule, dehiscing loculicidally at the mouth. *Seeds* small, angular or linear-cuneate; testa membranous; cotyledons longer than the radicle.

EUCALYPTUS GLOBULUS, Labill.

An introduction from Australia, largely grown in forests on the Nilgiris and other hills of the W. Ghâts and frequently found self-sown. The Blue Gum.

A lofty tree with very grey young leaves and narrow, green, linear-lanceolate, curved, vertically hanging old ones, white rather large flowers and rugose capsule, all parts very aromatic with a valuable essential oil which is largely extracted. Bark grey, the outer layers deciduous; wood grey with darker streak, smoderately hard, used in building but most especially for fuel.

Many other species of the genus are also found cultivated in gardens and plantations on the S. Indian hills.

Family LXIV. LECYTHIDACEAE.

Trees. *Leaves* alternate, entire or shortly toothed, usually crowded at the ends of the branchlets; stipules 0. *Flowers* large, solitary or in axillary or terminal racemes. *Calyx*-tube enclosing the ovary; lobes usually 4–6, rarely 2–3, valvate or imbricate. *Petals* 4–6, rarely more or 0. *Stamens* many, in several series; filaments slender; anthers small, sometimes wanting. *Ovary* 2–6, rarely more-celled, many-ovuled, the ovules pendulous or horizontal; style long, slender; stigma capitate. *Fruit* a woody, fleshy or fibrous berry, with 1 or many seeds.

Fruit angular, fibrous, 1-seeded; stamens all perfect
1. **Barringtonia.**
Fruit globose or ovoid, fleshy, many-seeded; stamens partly without anthers ....2. **Careya.**

1. Barringtonia, Forst.

Trees. *Leaves* alternate, usually membranous, entire or crenate-serrate, penninerved. *Flowers* in elongate, terminal or lateral, racemes or interrupted spikes; bracts small, deciduous; bracteoles minute or 0. *Calyx*-tube scarcely produced above the ovary; limb of 2–4, rarely 5, lobes; lobes imbricate or valvate. *Petals* 4, rarely 5, imbricate, adnate at base to the staminal tube.

Stamens very numerous, in many rows, connate below; filaments filiform, all bearing anthers. *Ovary* inferior, 2–4-celled; ovules 2–8 in each cell, pendulous or horizontal; style long, filiform; stigma small. *Fruit* a fibrous berry, globose ovoid or quadrangular, crowned by the persistent calyx-limb, 1-seeded. *Seed* ovoid or ellipsoid, exalbuminous; embryo large, cotyledons rudimentary.

Calyx-lobes valvate; fruit large, about 2 in. long, ovoid; flowers large, 1·5–2 in. in diam.; leaves large, up to 12 in. long. ..1. *racemosa.*
Calyx-lobes imbricate; fruit medium-sized, about 1 in. long, quadrangular; flowers rather small, ·3–·5 in. in diam.; leaves up to 6 in. long ....2. *acutangula.*

1. BARRINGTONIA RACEMOSA, Roxb.; F. B. I. ii. 507; W. & A. 333; Wt. Ic. t. 152.

W. Coast, in Malabar and Travancore, along backwaters, often planted for ornament.

A medium-sized ornamental tree with large flowers, cream-coloured with pink stamens, in pendulous racemes, and large brownish-red fruits. Wood white, soft, porous. Vern. *Tam.* Samuthram; *Mal.* Samuthraccham.

2. BARRINGTONIA ACUTANGULA, Gaertn.; F. B. I. ii. 508; W. & A. 333; Bedd. Fl. t. 204.

E. & W. Coast Districts along streams and on swampy land; more scarce inland in the Deccan and Carnatic.

A medium-sized tree, conspicuous for its long pendent racemes of pink flowers, succeeded by angular fruits, leaves obovate. Bark dark brown, rough; wood white, soft, with a pretty silver-grain, used for furniture. Vern, *Hind.* Ijal; *Ur.* Hinjolo; *Tel.* Kurpa; *Tam.* Adampa; *Mal.* Nir perzha.

2. Careya, Roxb.

Trees or a small undershrub. *Leaves* alternate, membranous, crowded at the ends of the branches, penninerved, crenate-serrate, *Flowers* large, showy, in racemes or interrupted spikes. *Calyx*-tube campanulate or funnel-shaped, hardly produced beyond the ovary; limb 4-lobed, the lobes imbricate. *Petals* 4, imbricate, much longer than the calyx-lobes. *Stamens* very numerous, in several rows, slightly connate at base; filaments very long, innermost and outermost without anthers. *Ovary* inferior, 4–5-

celled, crowned by an annular disk; ovules many, in 2 rows in each cell, on vertical axile placentas; style long, filiform; stigma small. *Fruit* a large globose fibrous berry, crowned by the persistent calyx-limb. *Seeds* numerous, in fleshy pulp; albumen 0; embryo large with obsolete cotyledons.

CAREYA ARBOREA, Roxb. Cor. Pl. t. 218; F. B. I. ii. 511; W. & A. 334; Wt. Ill. tt. 99 and 100; Bedd. Fl. t. 205.

All Forest Districts, in deciduous forest, especially in N. Circars, up to 5,000 ft., conspicuous in grassy places.

A large deciduous tree with yellowish-white flowers, large obovate-serrate leaves and large globular fruit. Bark thick, dark grey, gives a good fibre and makes slow matches; wood red, hard, of good quality but little used. Vern. *Hind.*, *Ur.* Kumbi; *Tel.* Gadava, Dudippi; *Tam.* Ayma; *Mal.* Perzha.

Family LXV. MELASTOMACEAE.

Herbs or shrubs, sometimes climbing, rarely trees. *Leaves* opposite or rarely whorled, entire or nearly so, often ribbed from the base; stipules 0. *Flowers* regular, hermaphrodite, in spikes panicles or corymbs, rarely solitary or fascicled, usually bracteate and bracteolate. *Disk* sometimes present. *Calyx*-tube free or partly or entirely adherent to the ovary; limb 4–5-lobed, sometimes calyptrate. *Petals* as many as the calyx-lobes, inserted on the margin of the tube, imbricate. *Stamens* as many or often twice as many as the petals and inserted with them; filaments bent inwards in bud, often alternately shorter and longer; anthers 2-celled, basifixed, dehiscence usually by terminal pores, sometimes by slits; connective often appendaged near the base. *Ovary* 4–5-, rarely 3- or 6- or 1-celled; ovules usually numerous, on axile parietal or central placentas, sometimes few; style terminal, usually filiform. *Fruit* usually enclosed in the calyx-tube, capsular or baccate, dehiscent irregularly or by slits at the top of the cells. *Seeds* many (usually 1 in *Memecylon*); albumen 0; cotyledons small (in *Memecylon* large and convolute).

Leaves 3- or more-ribbed from the base; ovary 4–5-celled, ovules and seeds many :—

Petals 4 or 5 :—

Seeds curved; flowers usually large and often showy :—

Stamens equal; fruit opening by pores at its apex **1. Osbeckia.**

Stamens unequal; fruit bursting irregularly......2. **Melastoma.**

Seeds straight, stamens equal:—

Flowers moderately large, fleshy and red, petals 4; climber **3. Kendrickia.**

Flowers rather small, pink or white, somewhat fleshy; epiphytic shrubs ....4. **Medinilla.**

Petals 3; seeds straight; stamens equal; inflorescence scorpioid; herbs ....5. **Sonerila.**

Leaves not ribbed but penninerved with faint intramarginal nerves; ovary 1-celled, few-ovuled; seed 1 ....6. **Memecylon.**

1. **Osbeckia**, Linn.

Herbs, undershrubs or shrubs, usually erect, branches usually 4-angled. *Leaves* opposite or sometimes ternate, entire, 3–7- or sometimes 9-ribbed. *Flowers* terminal, solitary capitate or panicled, purple-pink or white, often conspicuous; bracts conspicuous, sometimes involucrate. *Calyx*-tube urceolate or subglobose, sometimes much produced beyond the ovary, usually covered with bulbous-based bristles which are solitary or in sessile or stalked clusters or on pectinate scales; lobes 4 or 5, subulate or lanceolate, variously bristly, alternating with as many appendages usually stellately bristly. *Petals* 4 or 5, usually broadly obovate, ciliate. *Stamens* 8 or 10, equal or subequal; anthers oblong, truncate attenuate or beaked. *Ovary* semi-inferior, 4–5-celled, bristly at apex; ovules numerous in each cell on placentas radiating from the axis; style long, simple. *Fruit* a capsule opening by pores at its apex. *Seeds* many, curved, minutely tuberculate.

Flowers pentamerous (also, sometimes, *O. cupularis*); anthers attenuate at tip:—

Calyx-tube with simple bristles only; leaves 3–5-ribbed, outer pair of ribs very slender:—

Leaves elliptic, ·5–1 in. long, ·5 in. broad, acute at apex, obtuse at base, pale greenish when dry, bristles on upper surface many small adnate, also few large adnate only at base; branchlets strigose; calyx-lobes ovate, obtuse, appendages very short with only about 3 bristles. ....1. *minor.*

Leaves elliptic, 1–1·75 in. long, ·5–1 in. broad, acute at apex, acute or obtuse at base, yellowish-green when dry, bristles on upper

surface distant, lineolate, thick, completely adnate except a minute mucro; branchlets glabrous; calyx-lobes ovate-lanceolate, acuminate, appendages triangular with few bristles, one long
2. *lineolata.*

Leaves oblong-lanceolate, 1–2·25 in. long, ·5–·75 in. broad, acute at apex, obtuse at base, slightly yellowish when dry, bristles on upper surface slender, adnate except a short point; branchlets scabrous; calyx-lobes ovate oblong, rounded and stellately bristled at apex, ciliate on margins and with few bristles on back, appendages short with a small tuft..............................3. *aspera.*

Calyx-tube with simple bristles below, tufts above; leaves 3–7-ribbed, outer pair slender:—

Calyx-lobes broad, obtuse or retuse, appendages cylindrical with a tuft of many bristles:—

Calyx-lobes many-bristly at apex and in a line on back; leaves elliptic, acute at apex, rounded at base, 1–1·5 in. long, ·75 in. broad, bristles on upper surface slender, half adnate, half free; ribs 3 with a slender intramarginal pair.. . ...4. *courtallensis.*

Calyx-lobes few-bristly at apex only; leaves lanceolate, acuminate at apex, narrowed at base, 2–4 in. long, 1–1·5 in. broad, bristles on upper surface sparse, slender, half adnate; ribs 5–7, the outer 2 pairs slender.... . ...5. *Kleinii.*

Calyx-lobes short, acute, few-bristly at apex, appendages short, cylindrical with about 3 bristles; leaves lanceolate, acuminate, 1–2 in. long, bristles on upper surface few, slender, adnate below; ribs 5, the outer pair intramarginal... . ...6. *Lawsoni.*

Calyx-tube with conspicuous tufts of bristles, rarely simple at the base only:—

Tufts of bristles sessile as are appendages; calyx-lobes ovate, obtuse, bristly at apex, ciliate on margins; branchlets fleshy, glabrous, bluish when dry; leaves oblong-lanceolate, 1–1·5 in. long, ·3–·5 in. broad, 3-ribbed, lineolate on upper, nearly glabrous on lower surface........... ....7. *sublaevis.*

Tufts of bristles stalked as are appendages:—

Stalks of bristle-tufts and appendages very short, the bristles woolly, the tufts large, ·5–1 in. broad; leaves ovate, densely tawny-bristly on both surfaces, reticulate; ribs 7–9
8. *reticulata.*

Stalks of bristle-tufts and appendages elongate:—

Shrubs with many branches; leaves 5-ribbed:—

Calyx-lobes obtuse or emarginate at apex, the bristles pale and bulbous-based:—

Stems grey, with long retrorse stiff bristles; leaves lanceolate, acuminate, 3–4 in. long, 1 in. broad, the bristles on the upper surface few, long, adnate below in branched lineoles .... 9. *travancorica.*

Stems reddish with short, stiff, appressed bristles; leaves elliptic, acute, 1–3·5 in. long; ·5–2 in. broad, the bristles on the upper surface close, velvety, shortly adnate below 10. *Wightiana.*

Calyx-lobes acute at apex, the bristles rufous, always in tufts; leaves 1–1·5 in. long, ·5–1 in. broad, the bristles on the upper surface few, only little adnate below 11. *Leschenaultiana.*

Slender shrubs with few erect branches and scarcely woody stems, calyx-lobes acute, ending in a stellate tuft of bristles; leaves lanceolate, acute, 3-ribbed, 1–2 in. long, ·3–·8 in. broad, sparsely bristly to nearly glabrous above, glabrous beneath except on nerves ....12. *octandra.*

Calyx-tube with thin, flattened, rather sparse pectinate scales, the appendages similar, lobes lanceolate, acuminate, ·3 in. long; leaves lanceolate, long-petioled, 5-ribbed, up to 5 in. long, 1·5 in. broad, shortly scabrous on both surfaces ....13. *wynaadensis.*

Flowers usually tetramerous (4- or 5-merous in *O. cupularis*):—

Anthers gradually attenuate upwards; erect undershrubs with 4-angled stems and fruiting calyx constricted above:—

Densely hispid; leaves opposite, oblong-lanceolate; calyx-tube with scattered tufts of bristles, lobes oblong, glabrous except at apex, margins prominently ciliate-bristly, appendages branched 14. *hispidissima.*

Nearly glabrous; leaves usually in threes, linear-lanceolate, sparsely hispid-ciliate on margins and ribs; calyx-tube glabrous, the lobes with few short ciliate bristles, the appendages slender, not bristly .... 15. *rostrata* var. *pulchella.*

Anthers abruptly beaked, the beaks slender; herbs or small undershrubs with 4-angled stems:—

Calyx-tube glabrous, lobes white-ciliate on the margins, appendages short and broad with pectinate bristles; leaves linear-lanceolate .... 16. *chinensis.*

Calyx-tube with both simple and stellate bristles, lobes ciliate, the apices stellate-bristly, as are the slenderly stalked appendages; leaves oblong-lanceolate ....17. *zeylanica.*

Anthers short, truncate at apex; herbs or small undershrubs, the stems terete or slightly 4-angled:—

Calyx-tube in fruit ·15 in. long with 4 short lobes, each with a stellate cluster of bristles at tip, appendages similarly crowned on very short stalks; leaves elliptic, subacute, up to 2 in. long, 1 in. broad, drying greenish........................18. *truncata*.
Calyx-tube in fruit 25 in. long with 4 or 5 triangular lobes, each with a stellate cluster of bristles at tip, appendages long-stalked, stellately bristle-tipped; leaves elliptic or elliptic-ovate, acute, up to 1·5 in. long by ·75 in. broad, drying yellowish...19. *cupularis*.
Calyx-tube in fruit ·25 in. long with triangular ciliolate lobes; leaves narrowly lanceolate, 2–3 in. long, about ·5 in. broad, strigosely hairy above, shortly hispid beneath .... 20. *gracilis*.

1. OSBECKIA MINOR, Triana. *O. aspera*, Wt. Ic. t. 377.
W. Coast, in Travancore (Wight, Horsley).
A small shrub with small whitish-hairy leaves and purple-red flowers.

2. OSBECKIA LINEOLATA, Gamble in Kew Bull. 1918, 241.
W. Gháts, Nilgiri and Pulney Hills, at high levels, up to 6,000 ft.
A small erect shrub with glaucous branches and leaves drying yellowish-green, the upper surface with large lineoles, flowers purple-red.

3. OSBECKIA ASPERA, Blume; F. B. I. ii. 519 *in part*; W. & A. 323 *in part*.
W. Gháts, Courtallum in Tinnevelly Hills (Mitchel).
A small undershrub with purple flowers.

4. OSBECKIA COURTALLENSIS, Gamble in Kew Bull. 1918, 242.
W. Gháts, Courtallum in Tinnevelly (Wight).
A small shrub with red-purple flowers.

5. OSBECKIA KLEINII, W. & A. 323 *in note*. *O. aspera*, Bl. var. *Kleinii*, C. B. Clarke in F. B. I. ii. 519.
W. Coast, in Cochin and Travancore.
An erect undershrub with purple-red flowers in terminal leafy panicles and rather large leaves, sparsely bristly.

6. OSBECKIA LAWSONI, Gamble in Kew Bull. 1918, 242.
W. Gháts, Murchison in Travancore, at 2,000 ft. (Lawson).
A small erect undershrub with purple flowers in short terminal panicles.

7. OSBECKIA SUBLAEVIS, Cogn. in DC. Monog. vii. 321.
W. Gháts from Mysore to Nilgiris, on rocks at about 7,000 ft.

A small fleshy shrub with smooth glabrous glaucous bluish branches and bright purple flowers in small terminal corymbose cymes.

8. OSBECKIA RETICULATA, Bedd.; Fl. Br. Ind. ii. 520. *O. alveolata*, Bedd. Ic. t. 168.

W. Gháts, in the Anamalais and Pulneys, at 6,000–7,000 ft.

A large, very handsome shrub reaching 10–15 ft. in height, the whole plant except the deep purple petals covered with ferruginous hairs.

9 OSBECKIA TRAVANCORICA, Bedd. ex Gamble in Kew Bull. ined.

W. Gháts in the lower hills of Travancore (Beddome).

An undershrub easily known by its stems being clothed with long retrorse bristles.

10. OSBECKIA WIGHTIANA, Benth.; F. B. I. ii. 419; W. & A. 323; Wt. Ic. t. 998.

W. Gháts, in the Nilgiri, Anamalai and Pulney Hills, at 4,000–7,000 ft., often in rocky places.

A much-branched shrub reaching 8 ft. or more in height, with handsome purple flowers and pale-brown silky foliage, the leaves whitish beneath, like the calyx-tube.

11. OSBECKIA LESCHENAULTIANA, DC.; F. B. I. ii. 520. *O. Gardneriana*, Wt. Ic. t. 997.

W. Gháts, in the Nilgiri and Pulney Hills, at 6,000–8,000 ft., in damp places.

A branching shrub 8–10 ft. high with handsome purple flowers in terminal capitate heads, the calyx and small leaves with rufous hairs.

12. OSBECKIA OCTANDRA, DC.; F. B. I. ii. 521. *O virgata*, Don in W. & A. 323; Wt. Ic. t. 376.

W. Gháts, from the Nilgiris to Travancore, at about 3,000 ft.

A slender undershrub with small purple flowers and dark foliage, the leaves lanceolate.

13. OSBECKIA WYNAADENSIS, C. B. Clarke in F. B. I. ii. 521.

W. Gháts, in Wynaad, at about 4,000 ft.

A slender erect undershrub with purple flowers in sub-terminal corymbs, large long-petioled leaves and very characteristic comb-like scales on the calyx-tube.

14. OSBECKIA HISPIDISSIMA, Wt. Ic. t. 1612; F. B. I. ii. 516.

N. Circars, Mahendragiri Hill in Ganjam, 4,500 ft.

(Gamble), Madgol Hills of Vizagapatam, at 5,000 ft. (A. W. Lushington). Deccan, in Mysore, at Wostara (Cleghorn). A very hispid erect undershrub with large crimson flowers.

15. OSBECKIA ROSTRATA, D. Don; F. B. I. ii. 517.

Var. *pulchella*, Triana. *O. recalva*, Bedd. M.S. in Herb. Kew and B.M.

Carnatic, in the Sirumalai Hills, at 3,500 ft., in swampy places (Beddome).

An erect glabrous shrub reaching 4–6 ft. high, with rosy-purple flowers.

16. OSBECKIA CHINENSIS, Linn.; F. B. I. ii. 515.

N. Circars, Madgol Hills of Vizagapatam, about 4,000 ft. (A. W. Lushington).

An erect slender undershrub, reaching about 2 ft. in height with pale mauve flowers in capitate leafy heads.

17. OSBECKIA ZEYLANICA, Willd.; F. B. I. ii. 516; W. & A. 322.

N. Circars, Deccan and Carnatic, especially near the coast.

An erect annual herb with small purple mauve flowers in leafy capitate heads.

18. OSBECKIA TRUNCATA, Don in W. & A. 322; F. B. I. ii. 514; Wt. Ic. t. 375.

W. Coast from S. Canara to Travancore.

An erect annual herb with small purple flowers.

19. OSBECKIA CUPULARIS, Don in W. & A. 323; F. B. I. ii. 514. *O. Leschenaultiana*, Wt. Ic. t. 996, *not of* DC.

W. Gháts, from Coorg to Nilgiris and Pulneys, at 3,000–7,000 ft., in grass.

A herbaceous plant from a perennial rootstock, the flowers white tinged with pink, calyx-lobes and petals as often 5 as 4.

20. OSBECKIA GRACILIS, Bedd. in Trans. Linn. Soc. xxv. 216; F. B. I. ii. 518.

W. Gháts, Sispara Ghát, in the W. Nilgiris, at 4,000 ft. (Beddome).

An erect slender plant with purple flowers in few-flowered terminal panicles and narrow leaves, the calyx-tube greyish-blue when dry.

2. **Melastoma**, Linn.

Shrubs, usually erect and bristly. *Leaves* opposite, entire, petioled, elliptic or lanceolate, 3–7-ribbed. *Flowers* terminal, solitary or in clusters or panicles, large, purple or sometimes rose or white, usually 5-merous; bracts conspicuous. *Calyx*-tube ovoid or campanulate, covered with strigose or paleaceous hairs; lobes ovate or lanceolate, alternating with subulate appendages. *Petals* as many as calyx-lobes, broadly obovate, large. *Stamens* 10, alternately long, opposite calyx-lobes, with purple anthers and the connective produced at the base to end in two lobes and shorter opposite petals with yellow anthers and connective not produced but with 2 tubercles in front. *Ovary* ovoid, more or less adnate to the calyx-tube; ovules numerous; style simple. *Fruit* an irregularly dehiscent or soft berry-like capsule. *Seeds* minute, numerous, curved, minutely punctate.

MELASTOMA MALABATHRICUM, Linn.; F. B. I. ii. 523; W. & A. 324; Wt. Ill. t. 95.

E. & W. Coast Districts, rarer inland, in wet places and on the banks of streams, up to 6,000 ft.

A handsome shrub with large red-purple flowers, the calyx-tube covered with pale paleacous scales.

3. **Kendrickia**, Hook f.

An epiphytic climbing shrub, climbing like ivy with stem rootlets. *Leaves* opposite, petioled, fleshy, with two pairs of nerves, one from the base, the other from the midriba short way up. *Flowers* large in few-flowered terminal umbels; peduncles stout, 2-bracteolate. *Calyx*-tube urceolate, fleshy, slightly produced beyond the ovary, rose-purple; limb of 4 short fleshy lobes, greenish. *Petals* 4, fleshy, red, spreading. *Stamens* 8, equal, anthers opening at the summit by one pore; connective with a horn-like process at the base. *Ovary* inferior, 4–6-celled; ovules numerous; style simple, stout. *Fruit* a globose capsule, 1-celled by the absorption of the septa, opening at the apex by 4–6 valves. *Seeds* very many, minute, prismatic.

KENDRICKIA WALKERI, Hook. f.; F. B. I. ii. 526; Bedd. Ic. t. 271.

W. Ghâts, in the Anamalai Hills (Beddome), otherwise a Ceylon plant.

A very ornamental ivy-like climber, the lower stems adhering by rootlets, the branches free and pendent, the leaves various in shape.

4. Medinilla, Gaud.

Erect or scandent, often epiphytic, branching shrubs. *Leaves* opposite or whorled, entire, often fleshy, ribbed from the base of the blade. *Flowers* pink or white, in terminal panicles or axillary or lateral cymes, 4–5- rarely 6-merous, sometimes solitary; bracts sometimes coloured, usually deciduous. *Calyx*-tube usually ovoid or cylindric, the limb entire or obscurely toothed. *Petals* usually 4 or 5, ovate oblong or obovate, acute, somewhat fleshy. *Stamens* twice as many as the petals, equal; anthers opening by a terminal pore; connective with 2 tubercles in front at the base and a spur behind. *Ovary* inferior, 4–6-celled, with many ovules on axile placentas; style filiform. *Fruit* a berry, crowned by the limb of the calyx. *Seeds* numerous, ovoid or subfalcate, the raphe often thickened.

Leaves 3-5-ribbed, elliptic lanceolate, 3–3·5 in. long, 1·5 in. broad, usually acute at both ends, thinly fleshy; flowers axillary, fascicled, peduncles 1–3-flowered; stamens with very short anthers, the tubercles and spur very small ....1. *malabarica.*
Leaves 3-ribbed, the outer ribs obscure and close to the margin, orbicular, 1·5 in. in diam., very fleshy; flowers axillary on solitary peduncles; stamens with long, curved, acuminate anthers, the tubercles and spur prominent..2. *Beddomei.*

1. MEDINILLA MALABARICA, Bedd. Ic. t. 157; F. B. I. ii. 548.
W. Gháts, in the Nilgiris and Anamalais, at 3,000–7,000 ft. (Beddome).
An epiphytic subscandent shrub, the flowers and their peduncles, the petioles and the bases of the leaves all of a brilliant crimson colour.

2. MEDINILLA BEDDOMEI, C. B. Clarke in F. B. I. ii. 548. *M. radicans*, Bedd. Ic. t. 184, *not of* Blume. *Triplectrum radicans*, W. & A. 324.
W. Gháts, from Coorg to Wynaad and perhaps further south, at 2,000–3,500 ft.
An epiphytic fleshy shrub, rooting from the joints of the stems.

5. **Sonerila,** Roxb.

Herbs, sometimes shrubby below, sometimes stemless, often fleshy. *Leaves* opposite, the pairs equal or unequal, entire or serrulate, ribbed or nerved from near the base or penninerved. *Flowers* mostly purple reddish or white, in scorpioid cymes. *Calyx*-tube funnel-shaped campanulate or hemispheric; teeth 3, short. *Petals* 3. *Stamens* 3, rarely 6, equal, anthers oblong or lanceolate, connective without appendage. *Ovary* inferior, 3-celled, many-ovuled, the placentas axile; style simple, filiform; stigma small or capitellate. *Fruit* a capsule, enclosed in the persistent calyx-tube, dehiscing apically by 3 valves. *Seeds* very many, minute, smooth or tuberculate, the raphe forming a lateral appendage.

Stems erect, elongate :—
  Leaves membranous :—
    Small soft herb with very small flowers and small truncate anthers; stems glandular-pilose, often winged; leaves ovate, under 1 in. long, with a pair of slender nerves from above the base .... 1. *tenera.*
    Erect suffrutescent herbs with rather large flowers and acuminate or rostrate anthers :—
      Leaves with one slender pair of nerves from the base, a stronger pair a short way up covered with scattered bristly hairs, oblong-lanceolate, subentire, 1–1·5 in. long; fruiting capsule smooth, ribbed.. 2. *Clarkei.*
      Leaves with 2–3 pairs of nerves from the base and a pair or more of nerves a short way up, all ascending almost to the apex and joining in loops :—
        Leaves glabrous or nearly so, minutely serrate on the margins :—
          Leaves under 2·5 in. long, acuminate at apex, rounded at base, the petiole up to 1·25 in. long; fruiting capsule glabrous .... 3. *Brunonis.*
          Leaves 3–4 in. long, acuminate at apex, cordate at base, the petiole about 2 in. long; fruiting capsule glandular, hairy .... 4. *elegans.*
        Leaves with ferruginous silky hairs on both surfaces, acute at apex, narrowed at base, the margins ciliate, 1–3 in. long, the petiole about 1 in ; fruiting capsule with few glandular hairs.. 5. *travancorica.*

Leaves penninerved with 8–10 nerves on either side of midrib, ovate-lanceolate, long-acuminate, the base subcordate, unequal, 3–4 in. long, sharply serrate; fruiting capsule glabrous 6. *versicolor.*

Leaves, also stems, thick and fleshy:—

Calyx-tube and lobes glandular-pilose; leaves ovate, acute at apex, rounded or cordate at base, 7–9-ribbed from the top of the usually long petiole, up to 3 in. long by 1·5 in. broad, sharply bristly-serrate, sparsely glandular-pilose or glabrous...7. *speciosa.*

Calyx-tube glabrous, smooth, in fruit funnel-shaped from a thick pedicel; leaves lanceolate, acute at apex, narrowed and shortly auricled at base, conspicuously 3-ribbed from the top of the short petiole, up to 1·5 in. long, ·6 in. broad, sharply serrate, glabrous 8. *grandiflora.*

Stems creeping; calyx-tube in fruit campanulate from a slender pedicel; leaves ovate, acute at apex, rounded at base, slenderly 3–5-ribbed from the top of the petiole, up to 1·75 in. long, 1 in. broad, sharply bristly-serrate, glabrous..............................9. *pulneyensis.*

Stemless or with only short weak stems; capsule hemispheric, with a rim:—

Stems up to 6 in. long, quadrangular, sometimes hardly any; leaves penninerved, ovate-lanceolate, acute, rounded or cordate often unequally, at base, up to 4 in. long by 1·5 in. broad, sparsely bristly; peduncles up to 3 in. long with 4–8 flowers................10. *Rheedii.*

Stemless:—

Leaves ovate or ovate-lanceolate, usually cordate at base; peduncles more than 4-flowered:—

Slightly crispate-hairy; leaves with 3–4 pairs of nerves from the base, 2–3 on each side further up, up to 5 in. long, 3 in. broad, acuminate, minutely serrate; petals narrow; capsule ·1 in. long..11. *Wallichii.*

Glabrous; leaves with 2 pairs of nerves from the base, 1 pair further up, up to 2 in. long, 1 in. broad, acute, crenate-serrate; petals broad; capsule ·15 in. long ....12. *scapigera.*

Leaves orbicular, deeply cordate at base, 2–3 pairs of nerves from the base, others above, up to nearly 1 in. in diam., minutely serrate; peduncles less than 4-flowered; petals broad; capsule ·1–·15 in. long.....................................13. *rotundifolia.*

1. SONERILA TENERA, Royle Ill. t. 45, fig. 2; F. B. I. ii. 530.
N. Circars, in Ganjam (Gamble); W. Gháts, in Wynaad at 4,000 ft. on rocks, occasional south to Tinnevelly.
A small weak herb with small pink flowers.

2. SONERILA CLARKEI, Cogn. *S. amabilis*, Bedd.; F. B. I. ii. 533.
   W. Gháts, hills of Tinnevelly, at 2,000 ft. (Beddome).
   A small woody plant with mauve flowers.
3. SONERILA BRUNONIS, W. & A. 321; F. B. I. ii. 53; Wt. Ill. t. 94, Ic. t. 1059. *S. Arnottiana*, Thw. var. *tenella*, Bedd.; F. B. I. ii. 532.
   W. Gháts, at Courtallum in Tinnevelly (Wight), Anamalais, at 3,000 ft. (Beddome).
   An erect woody plant with mauve-purple flowers (blue in Wt. Ill. t. 94).
4. SONERILA ELEGANS, Wt. Ic. t. 995–3; F. B. I. ii. 535.
   W. Gháts, at Sispara in Nilgiris, at 6,000 ft.
   A pretty erect herbaceous plant with rather thick stems and mauve flowers.
5. SONERILA TRAVANCORICA, Bedd. Ic. t. 156; F. B. I. ii. 534.
   W. Gháts, Attraimalai Hills of Travancore at 3,500–5,000 ft. (Beddome).
   A pretty perennial undershrub with mauve flowers and silky foliage.
6. SONERILA VERSICOLOR, Wt. Ic. t. 1057; F. B. I. ii. 535.
   W. Gháts, in Nilgiri Hills, 3,000–6,000 ft.
   An annual undershrub with rose-coloured flowers, one side of the petals darker than the other.

   Var. *axillaris*. *S. axillaris*, Wt. Ic. t. 1058.
   W. Gháts, in W. Nilgiris and Wynaad, about 3,000 ft., distinguished by the racemes being axillary along the stem instead of terminal.
7. SONERILA SPECIOSA, Zenk. Pl. Ind. Coimb. t. 18; F. B. I. ii. 534; Wt. Ic. t. 995–2.
   W. Gháts, from Mysore to Nilgiris, where common in ravines, and Travancore Hills, at 5,000–7,000 ft.
   A very pretty fleshy species with mauve-pink flowers. *S. Bensonii*, Hook. f. in Bot. Mag. t. 6049; F. B. I. ii. 540, seems to be a 6-stamened form of this species.
8. SONERILA GRANDIFLORA, Wall.; F. B. I. ii. 535; W. & A. 322; Wt. Ic. t. 995, Spic. Nilg. t. 67.
   W. Gháts, in the Nilgiri, Anamalai and Pulney Hills, usually along streams, at about 6,000 ft.

A very pretty fleshy undershrub with purple flowers, sometimes paler, the small leaves prominently ribbed.

9. SONERILA PULNEYENSIS, Gamble in Kew Bull. 1919, 226.
W. Gháts, in the Pambar Ravine, Pulneys (Bourne).
A straggling fleshy plant rooting from the stems, the flowers not known.

10. SONERILA RHEEDII, W. & A. 321.
W. Gháts, Coorg to Malabar and Wynaad, at about 3,000 ft., on wet rocks.
A small short-stemmed or stemless plant with violet flowers.

11. SONERILA WALLICHII, Benn.; F. B. I. ii. 538.
W. Gháts, from Wynaad to the Anamalais, at 3,000 ft. and upwards.
A stemless plant with bright pink or mauve flowers.

12. SONERILA SCAPIGERA, Dalz.; F. B. I. ii. 538.
W. Gháts, Bababudan Hills of Malabar (Law).
A stemless glabrous plant with mauve flowers in many-flowered racemes.

13. SONERILA ROTUNDIFOLIA, Bedd.; F. B. I. ii. 538; Bedd. Ic. t. 169.
W. Gháts, Malabar Hills, Nilgiris and Anamalais, on rocks at 4,000–6,000 ft.
A small stemless plant with rather large mauve flowers in few-flowered racemes, the peduncles bright red.

6. Memecylon, Linn.

Shrubs or trees, glabrous. *Leaves* opposite, coriaceous, sessile or shortly petioled, nerves inconspicuous, joining a usually inconspicuous intramarginal nerve. *Flowers* usually axillary (in axils of same year's leaves) or lateral (in axils of fallen leaves on old wood), fascicled or in simple or panicled cymes or umbellules; bracteoles 2 or more, at or near the base of the pedicels. *Calyx*-tube above the ovary campanulate or saucer-shaped, limb truncate or shortly 4-lobed, often coloured, enclosing a frequently rayed disk. *Petals* 4, blue or white, rarely reddish. *Stamens* 8, equal; filaments long; anthers short, opening by slits, the connective thickened at the back, ending in a spur or horn. *Ovary* 1-celled; ovules 6–12, on a central placenta; style filiform, simple. *Fruit* a globose or ellipsoid berry, crowned by the calyx-limb, normally

1-seeded. *Seed* large, testa crustaceous, cotyledons convolute, foliaceous.

Leaves petioled, acute at base, not cordate, rarely rounded :—
Flowers sessile or very shortly pedicellate, in fascicles on axillary or lateral tubercles :—
Leaves lanceolate, acuminate ; flowers axillary :—
Leaves up to 10 in. long by 2·5 in. broad with prominent intra-marginal nerves connected by about 10–16 prominent straight nerves with the midrib ; flower-fascicles about ·5 in. broad, pedicels very short with lanceolate bracteoles ; calyx-tube campanulate, disk rays prominent and raised..... 1. *Heyneanum.*
Leaves up to 4 in. long by 1·25 in. broad, the 6–10 nerves and intramarginal nerve faint ; flower-fascicles ·2 in. broad, the few flowers sessile, bracteoles ovate ; calyx-tube campanulate, disk-rays very faint .... 2. *Lawsoni.*
Leaves elliptic-ovate, up to 3·5 in. long, 1·5 in. broad, shortly and obtusely acute to acuminate at apex, narrowed at base, dull and yellowish when dry, intramarginal nerve and about 6 branching nerves often visible ; peduncles very short, fascicled, axillary and lateral, flowers sessile in umbels, with ovate bracteoles and campanulate calyx-tube, disk rays not apparent .... 3. *Talbotianum.*
Leaves elliptic or elliptic-obovate, under 2 in. long, 1 in. broad, nerves not visible, petiole very short ; flowers axillary or lateral :—
Leaves green when dry ; branchlets very slender, pale ; tubercle small, flowers very shortly pedicellate with small bracteoles ; calyx above the ovary saucer-shaped, disk rays obscure 4. *Lushingtonii.*
Leaves yellowish when dry ; branchlets slender, nodose, rough, ultimate often quadrangular ; tubercles small, flowers shortly pedicellate with lanceolate bracteoles ; calyx above the ovary campanulate, disk rays obscure .... 5. *flavescens.*
Flowers clearly pedicellate, in pedunculate cymes :—
Cymes branched, lateral, the ultimate branches umbellulate :—
Leaves linear-lanceolate up to 3 in. long by ·5 in. broad, obtuse at apex, intramarginal nerve close to the margin, the nerves ascending ; calyx above the ovary saucer-shaped, the disk clearly but not thickly rayed .... 6. *angustifolium.*
Leaves ovate or ovate-elliptic, under 2 in. long by ·75 in. broad, obtuse or emarginate at apex, dull above, yellowish when dry, nerves not visible ; calyx campanulate, the disk rays conspicuous, raised .... 7. *umbellatum*

Leaves ovate, acute or obtuse or emarginate at apex, acute or obtuse at base, shining above, up *to 4 in. long by* 1·5 *in. broad,* when dry the upper surface greenish, the lower brown, intramarginal nerve and about 8–10 pairs of nerves faintly visible; peduncles about ·25 *in. long; calyx* campanulate, the disk rays slightly raised .... 8. *edule.*

Leaves ovate, acute or acuminate at apex, acute or obtuse at base, sometimes shining above, up to 7 in. long by 2 in. broad, nerves and intramarginal nerves slightly visible when dry; peduncles about ·5 in. long, pedicels filiform; calyx cup-shaped, the disk rays conspicuous .... 9. *grande.*

Cymes branched, the ultimate branches not distinctly umbellate:—

Cymes axillary, 3-flowered, pedicels filiform with bracteoles above the base, *peduncles* ·25–·5 *in. long; leaves ovate-lanceolate,* caudate-acuminate, up to 2 in. long, ·7 in. broad; calyx cup-shaped, white, disk distinctly rayed.......... 10. *gracile.*

Cymes lateral, short, *few-flowered*:—

Leaves green when dry, ovate-lanceolate, caudate-acuminate, 2–3·5 in. long, ·75–1·5 in. broad, the intramarginal nerve and about 8 pairs of nerves visible but faint; cymes scarcely ·2 in. long .... 11. *madgolense.*

Leaves yellow when dry, narrowly ovate-oblong, obtuse or emarginate, under 2 in. long, ·75 in. broad, intramarginal nerve and about 6–8 pairs of nerves faintly visible; cymes ·5 in. in diam; calyx in fruit saucer-shaped, disk rays apparent; branchlets quadrangular.......... 12. *molestum.*

Leaves sessile or nearly so, cordate or sometimes rounded at base:—

Flowers fascicled, singly or in very short-peduncled cymes on lateral tubercles, or rarely axillary:—

Leaves shortly (·1 in.) -petioled, rounded or slightly cordate at base, ovate-oblong, obtuse at apex, up to 3·5 in. long by 1·5 in. broad, intramarginal nerves and about 10 nerves visible; pedicels ·2 in. long; calyx campanulate above the ovary, the teeth acute, disk rays faint .... 13. *sisparense.*

Leaves sessile, cordate at base, ovate, obtusely acute, up to 2·5 in. long by 1·5 in. broad; pedicels ·15 in. long; calyx campanulate above the ovary, the teeth acute, disk rays faint

14. *malabaricum.*

Leaves sessile or very shortly (scarcely ·1 in.) -petioled, cordate, oblong-lanceolate, acuminate, up to 6 in. long by 1·5 in. broad;

pedicels ·1 in. long; calyx above the ovary saucer-shaped, papillose without, the disk rays faint; flowers lateral or axillary
15. *deccanense.*

Flowers fascicled on axillary or lateral small tubercles:—

Flower-clusters very small, few-flowered; branchlets quadrangular; leaves ovate, obtuse, up to 2 in. long, 1 in. broad, cordate, sessile; calyx funnel-shaped, slightly papillose, the disk rays faint.......................................16. *subcordatum.*

Flower-clusters about ·5 in. in diam., usually axillary; branchlets terete; leaves sessile, cordate, lanceolate, 3–6 in. long, 1–2 in. broad; calyx-tube above the ovary suddenly widened to saucer-shape, disk rays prominent.................................17. *depressum.*

Flowers in long (·5–·7 in.) -peduncled, subterminal or axillary umbels; leaves lanceolate, acuminate, 1·5–2·5 in. long, ·7–1 in. broad; pedicels ·2 in. long; calyx-tube cup-shaped, lobes acute; disk rays fairly prominent..............................18. *terminale.*

1. MEMECYLON HEYNEANUM, Benth.; F. B. I. ii. 560; W. & A. 319. *M. jambosoides*, Wt. Ic. t. 277.
   W. Gháts, in Wynaad, the Bolumpatti Valley and Tinnevelly Hills up to 3,000 ft.
   A shrub with prominently nerved leaves and blue flowers.
2. MEMECYLON LAWSONI, Gamble in Kew Bull. 1919, 226.
   W. Gháts, in S.E. Wynaad at about 3,000 ft. (Lawson).
3. MEMECYLON TALBOTIANUM, Brandis in Talb. Bomb. List, ed. 2, appendix.
   W. Gháts, Coorg or Nilgiris (G. Thomson); W. Coast, in S. Canara (Hohenacker).
   A tree reaching 30–40 ft. in height with blue flowers and yellow globose berry ·25 in. in diam.
4. MEMECYLON LUSHINGTONII, Gamble in Kew Bull. 1919, 227.
   Deccan, Horsleykonda in Cuddapah at 4,000 ft. (Gamble), Osabatti in Coimbatore (A. W. Lushington); W. Gháts, in E. Nilgiris at 4,000–6,000 ft.
   A large shrub with small leaves, pale blue flowers in small clusters and berry ·2 in. in diam.
5. MEMECYLON FLAVESCENS, Gamble in Kew Bull. 1919, 226.
   W. Gháts, in Nilgiri Sholas at and above 7,000 ft. (Gamble).
   A large shrub with many branches, usually obovate yellowish leaves, pale blue flowers and greyish berry ·3 in. in diam.

6. MEMECYLON ANGUSTIFOLIUM, Wt.; F. B. I. ii. 562; Wt. Ic. t. 276.

W. Gháts, in forests near Courtallum in Tinnevelly (Wight), usually on river banks.

A shrub reaching 6–8 ft. in height with purplish-blue flowers and black-purple berries.

7. MEMECYLON UMBELLATUM, Burm. f. *M. ramiflorum*, Lamk.; W. & A. 319. *M. tinctorium*, Koen.; W. & A. 319; Wt. Ill. t. 93. *M. edule* var. *ramiflora*. C. B. Clarke in F. B. I. ii. 563.

E. Coast Districts from the Kistna southwards; Deccan, from Cuddapah and N. Arcot to Coimbatore, in forests on the slopes; W. Coast, in Travancore.

A large shrub with yellowish foliage and small yellow berries, the flowers blue.

8. MEMECYLON EDULE, Roxb. Cor. Pl. t. 82; F. B. I. ii. 563 *in part only*.

N. Circars, in Ganjam, up to 4,500 ft. on Mahendragiri; Deccan, hills of N. Arcot and Cuddapah, common in dry evergreen forests.

A large shrub with blue flowers and black-purple, edible, fleshy berry ·25 in. in diam., the leaves shining on the upper surface. Bark light brown, rough; wood light brown, very hard and close-grained, a good fuel. Vern. *Ur.* Nirása; *Tel.* Alli; *Tam.* Kaya.

9. MEMECYLON GRANDE, Retz; F. B. I. ii. 557; W. & A. 320. *M. edule* var. *ovata*, C. B. Clarke in F. B. I. ii. 564.

W. Coast Districts from S. Canara to Travancore; W. Gháts, in the lower Pulney Hills.

A large shrub with rather long-peduncled cymes, largish leaves and brownish-black berry ·25 in. in diam.

10. MEMECYLON GRACILE, Bedd. Ic. t. 164; F. B. I. ii. 555.

W. Gháts, evergreen forests of Travancore and Tinnevelly at 1,000–3,000 ft., a common undershrub.

A pretty shrub with zig-zag branches, pale blue flowers and globose berry ·25 in. in diam. The wood makes good walking-sticks.

11. MEMECYLON MADGOLENSE, Gamble in Kew Bull. 1919, 227.

N. Circars, Madgol Hills of Vizagapatam at 3,000–4,500 ft. (A. W. Lushington).

A shrub, the berries about ·15 in. in diam.

12. MEMECYLON MOLESTUM, Cogn. *M. edule* var. *molesta*, C. B. Clarke in F. B. I. ii. 564.
W. Gháts, in the Nilgiri and Anamalai Hills at about 6,000 ft.
A tree reaching 30–40 ft. in height, with bright blue conspicuous flowers, the berries ·2 in. in diam.

13. MEMECYLON SISPARENSE, Gamble in Kew Bull. 1919, 227.
W. Gháts, on Sispara Ghát in W. Nilgiris, at 5,000 ft. (Gamble).
A large shrub or small tree with flower clusters about 1 in. in diam., the petals blue, calyx red.

14. MEMECYLON MALABARICUM, Cogn. *M. amplexicaule* var. *malabarica*, C. B. Clarke in F. B. I. ii. 559 *in part*.
W. Gháts, in moist sholas of the Nilgiri and Pulney Hills at 4,000–6,000 ft.
A small tree with bright blue flowers in clusters about ·5 in. in diam., the calyx red. Wood greyish-brown, very hard and close-grained, a good fuel.

15. MEMECYLON DECCANENSE, C. B. Clarke in F. B. I. ii. 560. *M. Heyneanum*, W. & A. 319, *not of* Benth.
W. Coast, in Malabar and Travancore at low levels.
A shrub, apparently scarce, the flowers blue with red calyx, the berries black, ·15 in. in diam., the flowers sometimes axillary.

16. MEMECYLON SUBCORDATUM, Cogn. *M. amplexicaule* var. *cordata*, Wight; F. B. I. ii. 559.
S. India, precise locality not known.

17. MEMECYLON DEPRESSUM, Benth. *M. amplexicaule* var. *malabarica*, C. B. Clarke in F. B. I. ii. 559 *in part*.
W. Coast and lower slopes of W. Gháts in Malabar and Travancore, up to 1,200 ft.
A shrub, rather variable in leaves, the branchlets sometimes terete, sometimes tetragonous; berries black, ·3 in. in diam.

18. MEMECYLON TERMINALE, Dalz.; F. B. I. ii. 558. *M. amabile*, Bedd. Ic. t. 163; F. B. I. ii. 555.
W. Gháts, in the hills of S. Canara up to 2,000 ft. (Beddome).
A slender, pretty shrub reaching about 10 ft. in height, with pale blue flowers.

Family LXVI. LYTHRACEAE.

Trees, shrubs or herbs. *Leaves* usually decussate, rarely alternate or verticillate, entire; stipules 0 or minute, generally deciduous. *Flowers* hermaphrodite, regular or sometimes zygomorphic, solitary or in axillary dichasia, sometimes paniculate; bracts and bracteoles small, usually deciduous. *Calyx*-tube persistent, cup-shaped campanulate or tubular; lobes 3–6, valvate, often with accessory appendages alternating with them. *Petals* as many as the calyx-lobes, alternate with them, inserted on the mouth of the tube, sometimes 0, frequently clawed and wrinkled. *Stamens* as many as, or twice as many as, the calyx-lobes or very many, inserted on the calyx-tube. *Ovary* free, in the bottom of the calyx-tube, 1–6-celled; the ovules on axile placentas; style long; stigma capitate. *Fruit* a dehiscent or indehiscent capsule opening by valves or irregularly, usually many-seeded. *Seeds* various in shape, sometimes winged; cotyledons flat or convolute.

Low, usually aquatic herbs with very small flowers; calyx membranous:—
- Placenta in the ovary not continuous with the style:—
  - Fruit dehiscent, opening in valves, the valves minutely horizontally striate .... 1. **Rotala.**
  - Fruit indehiscent, opening irregularly, the walls not striate .... 2. **Ammannia.**
- Placenta in the ovary continuous with the style, the fruit operculately or irregularly dehiscing........................3. **Nesaea.**

Trees or shrubs; calyx moderately thick:—
- Flowers zygomorphic; calyx-tube tubular, curved; shrub with under surface of leaves black-dotted...................4. **Woodfordia.**
- Flowers actinomorphic; calyx-tube not curved:—
  - Capsule circumsciss; flowers 6-merous, solitary in the leaf-axils; fleshy.......................5. **Pemphis.**
  - Capsule 3–6-valved; flowers 6-merous; stamens many; seeds winged.......................6. **Lagerstroemia.**
  - Capsule irregularly dehiscing; flowers 4-merous; stamens 8; seeds pyramidal.......................7. **Lawsonia.**

1. Rotala, Linn

Annual or rarely perennial herbs of wet places, stems often tetragonous. *Leaves* verticillate, opposite and decussate or rarely

alternate, entire, sessile or subsessile; stipules 0. *Flowers* very small, solitary and axillary or in terminal spikes or racemes, rarely in umbels, usually sessile; bracteoles 2. *Calyx*-tube campanulate or subglobose, often scarious and hyaline; lobes 3–6 with often subulate appendages between them. *Petals* as many as calyx-lobes, inserted between them, usually small, sometimes absent. *Stamens* 1–6, on the calyx-tube opposite the lobes. *Ovary* sessile or substipitate, 2–4-celled; ovules many; style columnar; stigma capitate. *Fruit* a septicidal 2–4-valved capsule, the walls minutely horizontally striate; placenta central, free at the top, one valve of the capsule crowned with the style. *Seeds* minute, ellipsoid or hemispheric, usually flattened on one side.

Flowers and leaves verticillate:—
 Petals 0; stamens fewer than the 5 calyx-lobes; bracteoles much longer than the calyx; capsule 2–3-valved ....1. *occultiflora.*
 Petals present; calyx-lobes and stamens 3 each; bracteoles much shorter than the calyx; capsule 3-valved. ....2. *verticillaris.*
Flowers and leaves opposite, decussate:—
 Flowers axillary or in numerous leafy spikes:—
  Calyx appendiculate, the appendices subulate, sometimes absent:—
   Petals minute, subulate, calyx-lobes long-acuminate; capsule 4-valved; very small almost filiform herbs ...... 3. *illecebroides.*
   Petals obovate; calyx-lobes acute; capsule 3-valved; herbs with tetragonous stems:—
    Calyx-lobes very short; petals very small; floral leaves not conspicuously smaller than those of the stem 4. *leptopetala.*
    Calyx-lobes triangular, acute; petals rather large; floral leaves usually much smaller than the others .... 5. *densiflora.*
  Calyx exappendiculate:—
   Stamens longer than the calyx, the calyx-lobes triangular, acute; petals 5, fimbriate; capsule 3-valved ....6. *fimbriata.*
   Stamens shorter than the calyx, the calyx-lobes acuminate; petals 4, obovate, entire; capsule 2-valved............7. *indica.*
 Flowers in close terminal spikes, with cordate floral leaves; petals 4, rose; capsule 4-valved:—
  Petals large, broadly obovate; stamens included; leaves rounded or suborbicular, shortly petioled ....8. *rotundifolia.*
  Petals small, narrowly obovate; stamens exserted; leaves orbicular, sessile...9. *macrandra.*

1. Rotala occultiflora, Koehne.
W. Coast, in Malabar (G. Thomson, quoted by Koehne).
A small water-herb with linear verticillate leaves and long bracteoles.

2. Rotala verticillaris, Linn.; W. & A. 303; Wt. Ic. t. t. 260 A. *Ammannia Rotala*, C. B. Clarke in F. B. I. ii. 567.
E. Coast, from Nellore (Bourne) southwards to Tranquebar (Rottler).
A small herb of ricefields with verticillate linear leaves.

3. Rotala illecebroides, Koehne. *Ammannia pentandra* var. *illecebroides*, C. B. Clarke in F. B. I. ii. 569.
W. Ghâts, in the Anamalai Hills, at 3.500 ft. (Fischer); no locality (Wight).
A very slender water-herb with erect slender stems, the leaves ovate-cordate, the calyx-lobes with conspicuous hair-like acumination.

4. Rotala leptopetala, Koehne. *Ammannia pentandra*, Roxb.; F. B. I. ii. 568 *in part.*
Plains Districts, chiefly on the East Coast, in moist places.
A herb 3 to 12 in. high with usually erect stems and rather few branches, hardly distinct from *R. densiflora*.

5. Rotala densiflora, Koehne. *R. Roxburghiana*, Wt. Ic. t. 260 B. *Ammannia pentandra*, Roxb.; F. B. I. ii. 568 *in part.*
Most plains Districts, in moist places.
A herb reaching 6–12 in. high with many divaricating floriferous branches.

6. Rotala fimbriata, Wt. Ic. t. 217. *Ammannia pentandra* var. *fimbriata*, C. B. Clarke in F. B. I. ii. 569.
Deccan, in Mysore, in ricefields and on tank borders (Wight), Horsleykonda, in Cuddapah, at 4,000 ft. (Gamble, Fischer).
A rather large herb reaching nearly 2 ft. in height, the lower nodes rooting, the leaves linear cordate.

7. Rotala indica, Koehne. *Ammannia peploides*, Spr.; F. B. I. ii. 566. *Ameletia indica*, DC.; W. & A. 303; Wt. Ic. t. 257 A.
Most Districts in ricefields and other wet places, in the hills up to 2,000 ft.
An extensively rooting much-branched herb, the obovate

spathulate thickly marginate stem leaves much larger than the slender floral ones which make short leafy spikes.

8. ROTALA ROTUNDIFOLIA, Koehne. *Ammannia rotundifolia*, Roxb.; F. B. I. ii. 566; W. & A. 306 *in part.*

All Districts, in ricefields and other wet places, up to 7,000 ft in the hills.

An extensively creeping herb forming large patches, conspicuous for its terminal spikes of pretty rose-coloured flowers.

9. ROTALA MACRANDRA, Koehne. *Ammannia rotundifolia*, W. & A. 306 *in part. Ameletia rotundifolia*, Wt. Ic. t. 258.

W. Ghâts, in the hills of Malabar (Bourne), Anamalais (Wight).

A flaccid herb, creeping and rooting at base, much branched, scarcely distinct from *R. rotundifolia.*

2. **Ammannia,** Linn.

Annual (or perhaps biennial sometimes) glabrous herbs of wet places, stems more or less tetragonous. *Leaves* decussate, sessile, often cordate at base; stipules 0. *Flowers* small, 4- or rarely 5-merous, in axillary sessile or pedunculate dichasia; bracteoles pale, membranous. *Calyx*-tube campanulate, later globose; lobes 4, triangular; appendages 0 or very short. *Petals* alternate, when present, between the calyx-lobes, sometimes 0. *Stamens* 4 or 8, on the calyx-tube. *Ovary* sessile, incompletely 1–5-celled; style erect; stigma capitate. *Fruit* a capsule, breaking up irregularly or circumsciss, the walls very thin, membranous, not striate. *Seeds* very many, small, a raphe on the inner face.

Style filiform; leaves usually auriculate-cordate; petals present:—
  Capsule as long as or longer than the calyx-tube; flowers pedicellate; stamens 4, included; petals small or absent ..... 1. *multiflora.*
  Capsule hidden in the calyx-tube; flowers subsessile; stamens 8, long exserted; petals ·1 in. long ....2. *octandra.*
Style thick; leaves narrowed or somewhat cordate at base; petals 0; capsules lightly longer than the calyx-tube; stamens 4...3. *baccifera.*

1. AMMANNIA MULTIFLORA, Roxb.; F. B. I. ii. 570; W. & A. 305.

All plains Districts, in wet places.

A small erect herb with narrow leaves.

2. AMMANNIA OCTANDRA, Linn. f.; F. B. I. ii. 571; Roxb. Cor. Pl. t. 133; W. & A. 304.

East Coast, on tank borders.

A rather large erect herb with large rose-coloured petals.

3. AMMANNIA BACCIFERA, Linn.; F. B. I. ii. 569. *A. vesicatoria*, Roxb.; W. & A. 305.

All plains Districts, in wet places.

An erect herb reaching sometimes 2 ft. in height, the leaves narrowed at the base.

Var. *aegyptiaca*, Koehne. *A. salicifolia*, C. B. Clarke in F. B. I. ii. 569. Leaves more or less cordate at base, the flowers and capsule larger.

Most Districts of the Circars and Deccan, and up to 5,000 ft. in the Nilgiri Hills.

3. **Nesaea,** Comm.

Annual or perennial herbs or undershrubs, stems often tetragonous. *Leaves* decussate or verticillate, sessile or shortly petioled; stipules 0. *Flowers* small, solitary and axillary, or in axillary dichasia; bracteoles 2. *Calyx*-tube campanulate urceolate or globose, herbaceous, lobes 4–8, appendices usually short or 0. *Petals* as many as the calyx-lobes, inserted between them, sometimes absent. *Stamens* 4–many, inserted on the calyx-tube. *Ovary* sessile, glabrous, 2–5-celled; ovules many; style 0 or short; stigma capitate. *Fruit* a globose or ellipsoid capsule, at first opening with an operculum, later irregularly below; placenta central, running up to the style, the valves remaining as wings. *Seeds* minute, flattened or hollowed on one side.

Leaves attenuate at base; calyx-tube usually pubescent, appendages horn-like, prominent .... 1. *lanceolata*.
Leaves cordate and subamplexicaul at base; calyx-tube glabrous, appendages short .... 2. *brevipes*.

1. NESAEA LANCEOLATA, Koehne. *Ammannia lanceolata*, Heyne; F. B. I. ii. 570.

Circars, Deccan and Carnatic, in wet places, near the Coast.

2. NESAEA BREVIPES, Koehne. *Ammannia cordata*, W. & A. 304; F. B. I. ii. 570.

Circars and Deccan.

4. Woodfordia, Salisb.

Shrubs, often arborescent, the branches terete or the younger tetragonous. *Leaves* opposite, entire, subcoriaceous, with black glandular dots on the under surface. *Flowers* in short axillary racemes, rarely solitary; bracteoles 2. *Calyx*-tube long, slightly curved, contracted above, oblique near the mouth; lobes 6, short, with short accessory appendages. *Petals* 6, very small. *Stamens* 12, inserted near the bottom of the calyx-tube, usually much exserted, the alternate ones longer; filaments filiform. *Ovary* sessile, 2-celled; ovules very many on axile placentas; style long, filiform; stigma minute. *Fruit* an ellipsoid, membranous capsule included in the calyx, the tube of which is sometimes split by it. *Seeds* many, cuneate, smooth.

WOODFORDIA FRUTICOSA, Kurz. *W. floribunda*, Salisb.; F. B. I. ii. 572. *Grislea tomentosa*, Roxb. Cor. Pl. t. 31; W. & A. 308.

N. Circars and Deccan, as far south as the hills of Kurnool, in deciduous forests, on dry hill sides and rocky places; W. Coast, in S. Canara (Wight).

A large deciduous shrub with scarlet flowers and lanceolate caudate leaves, whitish beneath Bark thin, grey; wood reddish-white and hard. The flowers give a red dye. Vern. *Hind.* Dawi; *Ur.* Jatiko; *Tel.* Jargi, Seringi.

5. Pemphis, Forst.

Shrubs or small trees. *Leaves* opposite, thick and fleshy, entire. *Flowers* solitary, axillary, pedunculate; bracteoles 2. *Calyx*-tube campanulate, coriaceous, ribbed; lobes 6, short, with 6 shorter appendages. *Petals* 6, inserted at the top of the calyx-tube, wrinkled. *Stamens* 12 (or 18), inserted in 2 rows on the calyx-tube. *Ovary* free, subsessile, 3-celled at the base; ovules many; style long; stigma capitate. *Fruit* a coriaceous capsule, nearly globose, circumsciss. *Seeds* numerous, compressed-angular, cuneate, margined.

PEMPHIS ACIDULA, Forst.; F. B. I. ii. 573; W. & A. 307. *Maclellandia Griffithiana*, Wt. Ic. t. 1996.

Sea coast and tidal backwaters in Malabar, Travancore and Tinnevelly.

A large branching evergreen shrub or small tree with grey-

silky pubescent small leaves under 1·5 in. long and pink flowers.

6. Lagerstroemia, Linn.

Trees or shrubs. *Leaves* opposite, distichous or the uppermost alternate, entire, petiolate, often glaucous beneath; stipules 2, deciduous. *Flowers* often large and showy, in axillary racemes often forming terminal usually trichotomous panicles; bracts 2, at the apex of the peduncles; bracteoles 2, on the pedicels. *Calyx*-tube campanulate, coriaceous, smooth or ribbed; lobes 6, valvate. *Petals* 6, sometimes more, inserted on the top of the calyx-tube, clawed, the blade wrinkled, the margins crispate. *Stamens* numerous, inserted near the base of the calyx-tube; filaments long, exserted. *Ovary* sessile, 3–6-celled; ovules many, ascending, on axile placentas; style long, curved; stigma capitate. *Fruit* an ellipsoid woody loculicidal capsule, 3–6-valved. *Seeds* numerous, flat, erect, falcately winged at the apex, testa hard; cotyledons orbicular, thin, convolute,

Ovary glabrous :—
  Calyx-tube smooth without :—
    Petals white, rather small, shortly clawed :—
      Calyx-tube with a ring inside the lobes appressed to the capsule in fruit; leaves greyish and glabrous or shortly pubescent beneath, rounded at base .... 1. *parviflora.*
      Calyx-tube without a ring; leaves narrowed at base :—
        Leaves glabrous or downy and bluish-white beneath up to 4 in. long; flowers scarcely ·25 in. broad; calyx lobes reflexed in fruit.. 2. *lanceolata.*
        Leaves ferruginous-villous beneath, up to 6 in. long; flowers more than ·25 in. broad ....3. *Thomsonii.*
    Petals variously coloured from white to crimson; leaves green beneath...*indica.*
  Calyx-tube ribbed without; petals large, mauve; leaves large, up to 8 in. long, green beneath................................4. *Flos-Reginae.*
Ovary densely villous; calyx-tube not ribbed, densely fulvous tomentose as is the under surface of the leaves........................5. *Rottleri.*

1. LAGERSTROEMIA PARVIFLORA, Roxb. Cor. Pl. t. 66; F. B. I. ii. 575; W. & A. 308; Wt. Ic. t. 69; Bedd. Fl. t. 31.
   N. Circars and Deccan as far south as the N. Nilgiris, in deciduous forest.

A large deciduous tree with rather small white flowers and a woody capsule varying in size. Bark light brown, thin, exfoliating in long scales; wood hard, useful for building and agricultural purposes. Vern. *Hind.* Sida, Bakli; *Ur.* Sidha; *Tel.* Chinangi.

2. LAGERSTROEMIA LANCEOLATA, Wall.; F. B. I. ii. 576; W. & A. 309. *L. microcarpa*, Wt. Ic. t. 109; Bedd. Fl. t. 30.

Deccan, in the Sandúr Hills of Bellary, up to 4,000 ft. (A. W. Lushington); W. Gháts and W. Coast, common in deciduous and dry evergreen forests up to 3,000 ft.

A large deciduous tree with small white flowers and small capsules. Bark smooth, white, peeling off in papery flakes; wood reddish-brown, moderately hard, useful and valuable for building and other purposes. Vern. *Tel.* Ventaku; *Tam.* Vevala; *Mal.* Venthekku; *Kan.* Billi nandi.

3. LAGERSTROEMIA THOMSONII, Koehne in Engl. Pflzreich xvii. 257.

"Mysore and Carnatic" (G. Thomson), probably W. Gháts, apparently very rare.

4. LAGERSTROEMIA FLOS-REGINAE, Retz; F. B. I. ii. 577. *L. Reginae*, Roxb. Cor. Pl. t. 65; W. & A. 308; Wt. Ic. t. 413; Bedd. Fl. t. 29.

W. Gháts, from S. Canara through Malabar to Travancore, chiefly along river banks and up to 3,000 ft.; hills of the N. Circars (Roxburgh); much cultivated for ornament, sometimes for timber.

A large deciduous tree, very handsome from its large mauve flowers, the seed capsules remaining long. Bark smooth, usually grey; wood light red, hard, valuable for building, for ship work and furniture. Vern. *Hind.* Jarúl; *Tam.* Kadali, Pu maruthu; *Mal.* Mani maruthu.

5. LAGERSTROEMIA ROTTLERI, C. B. Clarke in F. B. I. ii. 576.

Without locality (Rottler).

A well-marked but very little-known tree.

Lagerstroemia indica, Linn., is an ornamental large shrub or small tree, commonly cultivated in gardens, native of China.

7. **Lawsonia**, Linn.

A glabrous shrub, branches terete, branchlets sometimes tetragonous, ending in spines. *Leaves* opposite, entire, lanceolate;

stipules minute, deciduous. *Flowers* small, in terminal panicles; bracts small, deciduous. *Calyx*-tube short; lobes 4, spreading, ovate. *Petals* 4, obovate, wrinkled and crenate, inserted on the top of the calyx-tube. *Stamens* 8, inserted in pairs at the base of the calyx-tube and opposite the lobes; anthers oblong, the connective thick. *Ovary* subglobose, 2–4-celled; ovules many, on axile placentas; style long, thick; stigma capitate. *Fruit* a globose capsule, breaking up irregularly, ultimately 1-celled. *Seeds* numerous, pyramidal, closely packed; testa spongy; cotyledons orbicular, flat.

LAWSONIA INERMIS, Linn. *L. alba*, Lamk.; F. B. I. ii. 573; W. & A. 307; Wt. Ill. t. 87.

All plains Districts, cultivated as a hedge plant, perhaps wild on the Coromandel coast and in the Deccan. The Henna plant.

A deciduous shrub with white flowers and small leaves which give the "henna" dye. Bark greyish-brown, thin; wood grey, hard. Vern. *Hind.* Mehndi; *Ur.* Manghati; *Tel.* Gorinta; *Tam.* Marithondi; *Kan.* Gorantu.

Family LXVII. SONNERATIACEAE.

Trees or shrubs, glabrous. *Leaves* opposite, entire; stipules 0. *Flowers* regular, small or large, solitary or in panicles; bracts and bracteoles 0. *Calyx*-tube slightly united with the ovary; lobes 4–9, valvate. *Petals* as many as the calyx-lobes and alternate with them, sometimes 0. *Stamens* as many as the calyx-lobes and alternate with them or very many inserted within the rim of the calyx-tube; filaments bent inwards in bud. *Ovary* 2–20-celled, nearly superior; ovules numerous, in many rows; style long; stigma capitate or peltate. *Fruit* a dry or somewhat fleshy indehiscent or dehiscent capsule, many-seeded.

Sonneratia, Linn. f.

Glabrous sea-coast trees. *Leaves* opposite, petioled, coriaceous, entire. *Flowers* large, terminal, solitary or 2–3 together. *Calyx* thickly coriaceous; tube widely campanulate, lobes valvate. *Petals* 4–8 or 0. *Stamens* numerous, inserted on the circular rim of the calyx-tube, inflexed in bud. *Ovary* free or adnate at the base to the calyx-tube, many-celled; ovules many, ascending, on axile placentas; style long; stigma capitate. *Fruit* a subglobose,

10–15-celled, many-seeded berry, supported by the persistent calyx. *Seeds* small, curved, angular, embedded in pulp; cotyledons convolute; radicle short, terete.

Calyx-lobes 4; petals 0; stigma large, umbrella-shaped; leaves narrowly oblong .... 1. *apetala.*
Calyx-lobes 6; petals 6; stigma capitate; leaves obovate .... 2. *caseolaris.*

1. Sonneratia apetala, Buch.-Ham.; F. B. I. ii. 579; W. & A. 327.

E. Coast, in mangrove forests in the deltas of the Godavari, Kistna and Coleroon.

A moderate-sized evergreen tree with black smooth bark and reddish-brown wood. It gives, like the true mangroves (*Rhizophora*), upright root excrescences. Vern. *Tel.* Kyalanki; *Tam.* Marama.

2. Sonneratia caseolaris, Engl. *S. acida*, Linn. f.; F. B. I. ii. 579; W. & A. 327; Wt. Ic. t. 340.

W. Coast, along backwaters from S. Canara southwards.

A small evergreen tree with large showy pink-petalled flowers and large depressed-globose fruit. Wood grey, soft, even-grained. It also gives root-excrescences with even softer wood. Vern. *Mal.* Blatti, Thirala.

Family LXVIII. ONAGRACEAE.

Herbs, rarely undershrubs, sometimes aquatic. *Leaves* opposite or alternate, entire or toothed; in *Trapa* the submerged leaves pinnatipartite; stipules 0. *Flowers* hermaphrodite, axillary and solitary or in terminal and axillary spikes or racemes, regular or sometimes irregular. *Calyx*-tube wholly adnate to the ovary (half-adnate in *Trapa*); lobes 2–5, valvate. *Petals* epigynous, alternate with the calyx-lobes, rarely 0. *Stamens* as many as or twice as many as the petals and inserted with them. *Ovary* inferior (half-inferior in *Trapa*), 1–6-, usually 4-celled, ovules 1 or many in each cell, pendulous or half-ascending, placentas axile; style subulate; stigma capitate or 2–4-lobed. *Fruit* various, dehiscent or indehiscent, capsular or baccate, 1- or many-celled and -seeded. *Seeds* usually small; albumen 0 or a very thin layer.

Fruit a many-seeded capsule; leaves alternate:—
 Stamens twice as many as the calyx-lobes; ovary 4-celled:—
  Calyx scarcely produced beyond the ovary; capsule septicidal 1. **Jussieua.**
  Calyx usually much produced beyond the ovary; capsule loculicidal .... **Oenothera.**
 Stamens as many as the calyx-lobes; ovary 3–6-celled 2. **Ludwigia.**
Fruit indehiscent, 1–4-celled, 1–4-seeded:—
 Flowers 2-merous; ovary 1–2-celled, the ovules attached to the axis; small erect land herbs with small fruits having hooked hairs .... 3. **Circaea.**
 Flowers 4-merous; ovary 2-celled, the ovules attached to the septum; floating water herbs with large fruits with 2–4 spines 4. **Trapa.**

1. Jussieua, Linn.

Herbs or undershrubs, usually of wet places. *Leaves* alternate, usually entire. *Flowers* yellow or white, axillary, solitary; pedicels with 2 bracteoles. *Calyx*-tube narrow, scarcely produced above the ovary; lobes 4–6, acute, persistent. *Petals* 4–6, on the margin of an epigynous disk. *Stamens* twice as many as the petals and inserted with them. *Ovary* inferior, 4–5-celled; ovules many, axile, in several vertical rows at the inner angle of each cell; style simple, short; stigma 4–5-lobed. *Fruit* a linear, terete or angled, 4–5-celled capsule, septicidally 4–5-valved, crowned by the disk and calyx-lobes. *Seeds* numerous, small, the crustaceous testa including an empty cell forming the raphe, the embryo in a membranous inner coat; cotyledons oblong, obtuse.

Water-plants with floating or creeping stems; petals 5, white; leaves obovate or oblanceolate, obtuse; seeds with a narrow raphe...1. *repens.*
Erect plants of wet places; petals 4, yellow; leaves lanceolate, acute; seeds with a prominent raphe, appearing didymous in one variety .... 2. *suffruticosa.*

1. JUSSIEUA REPENS, Linn.; F. B. I. ii. 587; W. & A. 336.
 E. and W. Coast Districts, in or on the borders of ponds and tanks and watercourses.
 A pretty water-plant, floating by means of white cellular floats at the nodes of the main stem.
2. JUSSIEUA SUFFRUTICOSA, Linn.; F. B. I. ii. 587. *J. villosa*, Lamk.; W. & A. 336.

W. Coast and W. Gháts, in wet places up to 3,000 ft.
An erect hairy undershrub, reaching 4–6 ft. high, with large flowers.

2. **Ludwigia**, Linn.

Herbs. *Leaves* alternate, petiolate, narrowly lanceolate, entire. *Flowers* yellow, usually axillary, solitary, sessile or nearly so; pedicels with 2 bracteoles. *Calyx*-tube scarcely produced above the ovary; lobes 3–5, acute, persistent or late deciduous. *Petals* 3–5, inserted below the margin of an epigynous disk. *Stamens* as many as the petals and inserted with them; filaments short. *Ovary* inferior, 4–5-celled; ovules many, axile, attached in 2 or more vertical rows to the inner angle of each cell; style simple; stigma capitate. *Fruit* a linear or oblong 4–5-celled capsule, opening by terminal pores or breaking up irregularly along the sides. *Seeds* very many, small, smooth, with a narrow raphe; cotyledons rounded.

Capsule inflated, smooth, the seeds in many rows in each cell, not distinguishable through the walls ....1. *parviflora.*
Capsule not inflated, slender, the seeds in one row in each cell, prominently distinguishable through the walls........ ...2. *prostrata.*

1. LUDWIGIA PARVIFLORA, Roxb.; F. B. I. ii. 588; W. & A. 336; Wt. Ill. t. 101.
   Almost all Districts, in rice-fields and other wet places.
   An erect herb, up to 2 ft. high, the leaves lanceolate or linear-lanceolate up to 3 in. long, the flowers small, the capsule about ·3 in. long.
2. LUDWIGIA PROSTRATA, Roxb.; F. B. I. ii. 558; Wt. Ic. t. 762.
   W. Gháts, swamps in the Anamalais at 2,000 ft. (Beddome).
   A herb at first prostrate, then erect. the leaves lanceolate with very slender petioles, together up to 3·5 in. long; the flowers very small, the capsule ·5 in. long.

3. **Circaea**, Linn.

Herbs. *Leaves* opposite, petiolate, sinuate-dentate, membranous. *Flowers* very small, white, pedicelled, in terminal and axillary racemes; bracteoles minute. *Calyx*-tube ovoid, shortly produced

above the ovary; lobes 2. *Petals* 2, obcordate, inserted under the margin of the epigynous disk. *Stamens* 2, alternate with the petals; filaments filiform. *Ovary* inferior, 1–2-celled; ovules attached to the inner angle of the cells; style filiform; stigma capitate. *Fruit* small, pyriform, indehiscent, hispid with hooked hairs. *Seeds* 1 in each cell, ellipsoid; cotyledons flat.

CIRCAEA ALPINA, Linn.; F. B. I. ii. 589; Wt. Ill. t. 101.

W. Ghâts, in the Nilgiri and Pulney Hills, at about 7,000 ft., in shady places.

A small, slender herb, reaching about 6–8 in. high, with membranous ovate leaves and 3-seeded fruit.

4. **Trapa,** Linn.

Aquatic floating herbs. *Leaves* dimorphic, the submerged ones opposite, root-like, primatipartite, the floating ones rosulate, rhomboid, the petiole with a spongy swelling near its apex. *Flowers* axillary, solitary, peduncled. *Calyx*-tube short, adnate to the lower part of the ovary; lobes 4, 2 or all becoming spines on the fruit. *Petals* 4, sessile, white, inserted on the margin of the epigynous, cup-shaped disk. *Stamens* 4. *Ovary* 2-celled, semi-inferior with a conical apex; ovule solitary in each cell; pendulous; style subulate; stigma capitate. *Fruit* large, bony, 1-celled, with 4 angles, 2 or all of which spinose, indehiscent, with a short beak through which the radicle is protruded. *Seed* 1, inverted, cotyledons very unequal; radicle incurved.

TRAPA BISPINOSA, Roxb. Cor. Pl. t. 234; F. B. I. ii. 590; W. & A. 337.

Most plains Districts, floating in tanks, sometimes cultivated. The Water-Chestnut.

A plant with long stems bearing pectinate leaves (stipules, according to some authors) beneath the surface and curious rhomboid rosulate leaves with swollen petioles on the surface. The 2-spined fruit is eaten, either raw or cooked, and gives much starch. Vern. *Hind.* Singhara.

Var. *incisa*, Wall. Leaves smaller, more deeply incised at the margins, less villous; fruit smaller. W. Coast Districts (Wight).

Oenothera rosea, Ait., and *O. tetraptera*, Cav., also perhaps some other species, are found in gardens and apparently run

wild on the Nilgiri Hills, and sometimes on other hills in the Deccan and W. Gháts.

Family LXIX. SAMYDACEAE.

Trees or shrubs. *Leaves* alternate, rarely opposite, petiolate, simple, entire, crenate or serrate, often with pellucid glands; stipules small or 0. *Flowers* regular, usually hermaphrodite, small, in axillary or subterminal fascicles racemes or panicles; pedicels articulate, bracteolate. *Calyx* coriaceous, persistent, tube short or long, sometimes adnate to the ovary; lobes 3–7, imbricate or valvate. *Petals* as many as the calyx-lobes or 0, perigynous. *Stamens* definite or indefinite, often alternating with staminodes, sometimes fascicled opposite the petals; anthers didymous or oblong. *Ovary* 1-celled, superior or half-superior; ovules many, on 2–5 parietal placentas; style 1 with capitate stigma, or styles 2–5. *Fruit* a loculicidal 2–5-valved capsule, the valves alternating with the placentas. *Seeds* few or many, oblong or angular, sometimes arillate, albuminous.

Petals 0; flowers in axillary fascicles........................1. **Casearia.**
Petals present; flowers in axillary or subterminal, sometimes panicled, racemes .... 2. **Homalium.**

1. Casearia, Jacq.

Shrubs or trees. *Leaves* alternate, distichous, petioled, entire or serrate, with pellucid transparent glands, usually both as dots and lines; stipules small, lateral, caducous. *Flowers* small, greenish-yellow, in axillary fascicles (Indian species); pedicels jointed above their base, surrounded by many scale-like bracteoles. *Calyx* inferior, deeply 4–5-lobed; lobes imbricate, obtuse, persistent. *Petals* 0. *Stamens* normally twice as many as the calyx-lobes, alternating with as many staminodes tufted at their apex, the stamens and staminodes forming a ring attached below to the calyx-tube; filaments subulate. *Ovary* free, ovoid, 1-celled; ovules many, on (usually 3) parietal placentas; style simple; stigma capitate or 3-fid. *Fruit* a succulent, ellipsoid, 3- or rarely 2-valved capsule, angled or ribbed when dry. *Seeds* many, angular or obovoid, with an enveloping fleshy coloured (usually

orange or red) aril; testa coriaceous or crustaceous; albumen fleshy; cotyledons flat; radicle terete, superior.

Leaves glabrous:—

Leaves broadly elliptic, coriaceous when old:—

Leaves rounded at base, obtuse or very shortly pointed at apex; blade up to 6–7 in. long, 4 in. broad, crenate-serrate, prominently reticulate; capsule ·7 in. long, yellow.................... 1. *graveolens.*

Leaves attenuate at base, acuminate at apex, the acumen twisted; blade up to 6 in. long, 3 in. broad, entire, shining above, not prominently reticulate; capsule ·7 in. long............. 2. *rubescens.*

Leaves narrowly elliptic, chartaceous when old:—

Leaves elliptic-oblong or -lanceolate, attenuate at base, acute or acuminate at apex, the acumen twisted; blade up to 5 in. long, 2 in. broad, entire or distantly serrate, reticulate beneath; capsule ·5 in. long or less, orange.................................... 3. *esculenta.*

Leaves elliptic-oblanceolate, cuneate at base, acuminate at apex; blade up to 6 in. long by 2·5 in. broad, entire, pale, main nerves prominent; capsule up to 1 in. long, bright orange .... 4. *varians.*

Leaves obovate, coriaceous, cuneate at base, obtuse or shortly-pointed at apex; blade up to 4 in. long, 2·25 in. broad, often cucullate, entire, pale, but usually drying nearly black; capsule ·7 in. long, orange-yellow .... 5. *coriacea.*

Leaves hairy:—

Leaves thick, branchlets and inflorescence softly pale brown-tomentose; leaves subcoriaceous, oblong, unequally rounded at base, acuminate at apex; blade up to 6 in. long, 2·5 in. broad, crenate-serrate; capsule ·5–·8 in. long, yellow........... 6. *tomentosa.*

Leaves and slender branchlets and inflorescence rufous-villous; leaves membranous, oblanceolate, long and sharply acuminate; blades up to 5 in. long, 2 in. broad, sharply serrate; capsule small, orange........................... .... 7. *wynadensis.*

1. Casearia graveolens, Dalz.; F. B. I. ii. 592.

N. Circars, in Ganjam, chiefly on old cultivated lands.

A small deciduous tree conspicuous in forest by its rather large leaves turning red in winter before falling. Bark dark grey; wood light yellow, moderately hard, even-grained. Vern. *Hind.* Chilla; *Ur.* Giridi.

2. Casearia rubescens, Dalz.; F. B. I. ii. 593.

W. Gháts, in the forests of Coorg (G. Thomson); hills of Travancore, 3,500 ft. (Bourdillon).

A large shrub, apparently evergreen, the glabrous branchlets

with large lenticels. The Travancore specimens have more lanceolate leaves.

3. Casearia esculenta, Roxb.; F. B. I. ii. 592.
E. Coast, in the Circars and southwards; Striharikota and similar forests of the Carnatic; W. Coast, from S. Canara to Cochin.
A small tree with many fascicles of flowers from the leaf-axils, apparently evergreen. Roxburgh says the leaves are eaten. Vern. *Tel.* Kunda jungara.

4. Casearia varians, Bedd. Fl. t. 208, *not of* Thw.
Evergreen forests of Travancore up to 3,000 ft.
A small glabrous apparently evergreen tree. Bark green, smooth; wood yellowish-white, even-grained. Vern. *Mal.* Vella kunnan.

5. Casearia coriacea, Thw.; F. B. I. ii. 592.
W. Gháts, Shola forests of the Nilgiris, Anamalais and Pulneys above 6,000 ft.
An evergreen tree with yellowish-white smooth bark.

6. Casearia tomentosa, Roxb.; F. B. I. ii. 593; Brand. For. Fl. t. 31. *C. elliptica*, Willd.; Wt. Ic. t. 1849.
All plains forest Districts of the Circars, Deccan and Carnatic, very common in open, much-grazed lands; rare in W. Gháts, W. side.
A bushy shrub or small deciduous tree in open lands, a much larger tree in forest, the oblong leaves generally tomentose, sometimes nearly glabrous. Bark thick, pale; wood yellowish-white, close-grained. Vern. *Hind.* Chilla; *Ur.* Girari; *Tel.* Chilaka duddi.

7. Casearia wynadensis, Bedd. Ic. t. 160; F. B. I. ii. 594.
W. Gháts, in the forests of Malabar, Travancore and Tinnevelly at 2,000–3,000 ft.
A small villous tree with slender branchlets and trifid stigmas.

2. **Homalium,** Jacq.

Trees or shrubs. *Leaves* alternate, crenate or serrate, rarely entire, petiolate; stipules small or 0. *Flowers* small, in slender axillary and subterminal, simple or panicled, racemes; bract at the base of the pedicel often prominent, caducous. *Calyx*-tube turbinate, adnate to the base of the ovary; lobes 5–7, narrow

persistent. *Petals* 5–7, inserted in the throat of the calyx, persistent. *Stamens* opposite the petals, solitary or in fascicles, alternating with glandular staminodes. *Ovary* half-superior, 1-celled; ovules many, on parietal placentas near the top; styles 2–5, filiform; stigmas capitellate. *Fruit* a coriaceous capsule, 2–5-valved at the apex. *Seeds* small, oblong or angular; albumen fleshy; cotyledons foliaceous.

Stamens solitary opposite each petal:—
Racemes simple, elongate:—
Leaves obovate, obtuse or emarginate and very shortly apiculate at apex, tomentose beneath, repand-crenate, main nerves about 12 pairs, parallel and with parallel transverse nervules; sepals and petals very similar ....1. *tomentosum.*
Leaves elliptic, abruptly acuminate at apex, glabrous beneath, coarsely crenate, main nerves 6–8 pairs, arching and rather irregular, reticulate between; petals larger than the sepals
2. *zeylanicum.*
Racemes in panicles; leaves ovate or elliptic, acuminate at apex, puberulous beneath, crenate, main nerves about 8 pairs, rather irregular and reticulate between; petals longer and broader than the sepals .... 3. *nepalense.*
Stamens in fascicles of 3–4 opposite each petal; racemes simple, up to 6 in. long; leaves ovate, bluntly acute or acuminate at apex, glabrous, crenate, main nerves about 7–8 pairs, irregular; petals much longer than the sepals.................................4. *travancoricum.*

1. HOMALIUM TOMENTOSUM, Benth.; F. B. I. ii. 596.
N. Circars, in the forests of Ganjam (Gamble).
A large deciduous tree, the flowers in long racemes, the leaves in young trees and shoots sometimes up to 10 in. long and 5 in. broad. Bark thin, greyish-white; wood brown, hard and heavy.

2. HOMALIUM ZEYLANICUM, Benth.; F. B. I. ii. 596; Bedd. Fl. t. 210. *Blackwellia tetrandra*, Wt. Ic. t. 1851.
W. Gháts, in evergreen forests up to 3,000 ft., common on old coffee estates.
A large evergreen tree, the young leaves bright red, the flowers fragrant. Bark pale, rough; wood brownish-red, hard. Vern. *Mal.* Manthala mukki.

3. HOMALIUM NEPALENSE, Benth.; F. B. I. ii. 596. *Blackwellia napalensis*, Wall. Pl. As. Rar. t. 179.

E. Gháts, Mahendragiri Hill in Ganjam at 4,500 ft., Rumpa Hills of Godavari (Gamble).

A tree with creamy-white bark and moderately hard white wood.

4. Homalium travancoricum, Bedd. Fl. 211; F. B. I. ii. 598.

W. Gháts, hills of S. Travancore and Tinnevelly, in evergreen forests at low levels.

A medium-sized ornamental tree with greenish-white flowers.

Family LXX. TURNERACEAE.

Turnera ulmifolia, Linn., is a West Indian plant with bright yellow flowers, a common weed of roadsides and waste ground, especially along the Coromandel Coast. The chief varieties are var. *elegans*, Urb., with ovate coarsely-toothed, and var. *angustifolia*, Willd., with lanceolate serrate leaves. The former seems the most common on the W. Coast, the latter on the East.

Family LXXI. PASSIFLORACEAE.

Shrubs or herbs, usually climbing by means of tendrils. *Leaves* alternate, simple or lobed, frequently glandular beneath, petiole often glandular; stipules 2, deciduous or persistent, sometimes 0; tendrils axillary or 0. *Flowers* regular, hermaphrodite or unisexual, axillary, solitary racemose or cymose-paniculate, often showy; bracteoles 3, minute and scattered or foliaceous and forming an epicalyx, rarely 0. *Calyx*-tube short or long, coriaceous or membranous, persistent; lobes 5, imbricate. *Petals* 0, or 5 attached to the calyx-tube, free or connate, imbricate, often marcescent. *Corona* of one or more rows from the calyx-tube, tubular or split into erect or radiating filaments, sometimes 0. *Stamens* 5, on a gynandrophore or free at the base, perigynous; anthers oblong, 2-celled, basi-fixed or versatile, introrsely dehiscing. *Ovary* superior, on a gynophore or subsessile, 1-celled with 3 parietal placentas and numerous ovules; styles 1 or 3; stigmas reniform capitate or flattened. *Fruit* a berry or capsule. *Seeds* numerous, ovoid or flattened, often pitted, with a fleshy aril; albumen fleshy; cotyledons leafy; radicle short, terete.

Flowers hermaphrodite, usually large; corona of corolla conspicuous; fruit a large fleshy berry .. .. 1. **Passiflora.**
Flowers unisexual, small; corona small or none; fruit a capsule
2. **Adenia.**

1. **Passiflora,** Linn.

Twining herbaceous or shrubby plants, tendril-bearing. *Leaves* simple or palmately lobed, usually glandular beneath at the base or on the petiole; stipules slender or leafy. *Flowers* hermaphrodite, solitary or cymose; bracteoles 3. *Calyx*-tube fleshy; lobes 5. *Petals* 5, inserted on the throat of the calyx. *Corona* of 1 to several rows of numerous usually filiform segments with 1 or more membranous folds lower down and a shallow cup surrounding the gynandrophore. *Stamens* 5, from the gynandrophore; anthers oblong, dorsifixed. *Ovary* 1-celled, many-ovuled; styles usually 3. *Fruit* a fleshy indehiscent berry. *Seeds* many, arillate, often pitted; albumen fleshy; cotyledons foliaceous.

PASSIFLORA LESCHENAULTII, DC.; F. B. I. ii. 599; W. & A. 352; Wt. Ic. t. 39.

W. Gháts, in the Nilgiris and Pulneys, above 5,000 ft.

A climbing shrub with curious semi-orbicular leaves, rounded at base, broadly truncate and 3-cuspidate above, white flowers and yellowish ovoid berry with pitted seeds.

Passiflora edulis, Sims, the Passion fruit from Brazil, is sometimes cultivated in the hills and may occasionally be found run wild. It has 3-lobed toothed leaves. *P. calcarata,* Mast., is a Madagascar species with 3-lobed leaves and large prominent stipules, run wild and now common on the Nilgiris. *P. foetida,* Linn., is a tropical American species commonly run wild near towns and along roadsides in many places in the plains and at once recognised by the moss-like pectinate involucre of the flowers. Several other species are also found in gardens.

2. **Adenia,** Forsk.

Twining herbs or undershrubs, tendril-bearing. *Leaves* entire, palmately lobed or pinnatifid, usually with large glands on the leaves and the top of the petiole; stipules 0 or inconspicuous. *Flowers* monoecious, usually small, in axillary cymes, the

peduncles often produced into tendrils. *Calyx*-tube campanulate or tubular; lobes 4–5. *Petals* 4–5, inserted on the throat or bottom of the calyx-tube. *Male flowers:* stamens 4–5, at the bottom of the calyx-tube, opposite as many scales or glands; filaments free or connate; anthers basifixed; ovary rudimentary or 0. *Female flowers:* staminodes 4–5, opposite as many scales or glands; ovary stalked or subsessile; ovules numerous, attached to 3 parietal placentas; style 0 or 3-fid; stigmas 3. *Fruit* a loculicidal 3-valved capsule. *Seeds* numerous, arillate, flattened, usually pitted; funicle long; albumen fleshy; cotyledons foliaceous.

Flowers very small; petals attached to the throat of the calyx-tube, small, obovate; anthers short, filaments combined in a tube; corona a fringe of short hairs at the bases of the petals; leaves ovate, entire or hastate or palmately 3-lobed, glandular at the top of the petiole; capsule 1 in. long .... 1. *Wightiana.*
Flowers rather large; petals attached to the base of the calyx-tube, linear-spathulate, long-fringed; anthers long, filaments forming a cup below; leaves palmately 3–5-lobed, rarely undivided, glandular at the sinuses and base; capsule 2 in. long ....2. *palmata.*

1. ADENIA WIGHTIANA, Engl. *Modecca Wightiana*, Wall.; F. B. I. ii. 601; W. & A. 353; Wt. Ic. t. 179.
   Deccan and Carnatic, in dry hilly country from N. Arcot southwards, at low levels.
   A tuberous-rooted slender climber with very small flowers, the petioles much twisted.
2. ADENIA PALMATA, Engl. *Modecca palmata*, Lamk.; F. B. I. ii. 603; W. & A. 353; Wt. Ic. t. 201.
   Hills of the Carnatic, W. Gháts and W. Coast in moist hilly country at low levels.
   A large tuberous-rooted woody climber, the stems thickened at the nodes, the leaves large and deeply palmate.

Family LXXII. CARICACEAE.

CARICA PAPAYA, Linn., the Papaw tree, a soft-wooded, almost branchless tree, introduced from South America, is cultivated in gardens in the plains Districts for its valuable edible fruit, which is of the size of a small melon with a soft yellow pulp. Vern. *Hind.* Papáya, Popai.

Family LXXIII. CUCURBITACEAE.

Herbs or undershrubs, rarely shrubs, prostrate or climbing by means of tendrils spirally twisted. *Leaves* alternate, petioled, simple or lobed or palmately or pedately divided, often cordate at base; stipules usually 0. *Flowers* regular, monoecious or dioecious, yellow or white, solitary paniculate or racemose. *Calyx*-tube usually adnate to the ovary; limb rotate campanulate or tubular, lobes 5, rarely 3–6, imbricate. *Petals* as many as the calyx-lobes, free or gamopetalous, sometimes lobed or fimbriate, valvate or involute in bud. *Stamens* inserted at the mouth, near the middle or at the base of the calyx-tube, usually 3; anthers free or connate, usually 1 1-celled, the others 2-celled, the cells straight, flexuose or conduplicate, the connective sometimes produced; in ♀ flowers staminodes often present. *Ovary* inferior, usually of 3 connate carpels; ovules usually many, horizontal, rarely few and erect or pendulous; placentas usually 3, vertical, parietal or partly intruded, and so spuriously 3-celled; style 1 with 3 stigmas, rarely styles 2–4; in ♂ flowers pistillodes often present. *Fruit* usually a fleshy berry, indehiscent or dehiscing by valves or by a circumscissile lid. *Seeds* usually many, in pulp or fibre, often compressed; outer testa often corrugate and margined, inner membranous; albumen 0; cotyledons fleshy or foliaceous, radicle short.

Ovules horizontal:—
  Anther-cells flexuose or conduplicate:—
    Corolla rotate or campanulate, 5-partite to the base:—
      Petals fimbriate on the margins ....1. **Trichosanthes.**
      Petals entire:—
        Calyx-tube of ♂ elongate; anthers cohering, included:—
          Pistillodes 1–3, subulate; tendrils simple; fruit small, acute at both ends; slender climbers ...2. **Gymnopetalum.**
          Pistillodes glandular or 0; tendrils bifid; fruit very large, variously shaped; stout climber .... **Lagenaria.**
        Calyx-tube of ♂ short; anthers free or slightly cohering, usually exsert:—
          Stamens free, inserted on the mouth of the calyx; ♂ flowers usually with a large bract; tendrils simple...3. **Momordica.**
          Stamens free, inserted on the tube of the calyx:—

♂ flowers in racemes; fruit fibrous, opening by a stopple at the apex; tendrils 2–5-fid ....4. **Luffa.**

♂ flowers solitary or fascicled:—

Calyx-lobes subulate, entire, erect; scaberulous herbs:—

Pistillode 0; tendrils bifid; seeds pyriform, surrounded by a thick crenulate ring... 5. **Bryonopsis.**

Pistillode glandular; seeds compressed, usually smooth:—

Connective produced; tendrils simple...6. **Cucumis.**

Connective not produced; tendrils 2–3-fid 7. **Citrullus.**

Calyx-lobes subfoliaceous, serrate, reflexed; tendrils 2-fid; large hairy climber...... . ...**Benincasa.**

Corolla campanulate, 5-lobed to the middle or lower; tendrils usually simple:—

Filaments connate; stigma 1, 3-lobed; flowers white or yellow; slender climbing or prostrate herbs; seeds compressed, margined, velvety or scrobiculate ....8. **Coccinia.**

Filaments free; stigmas 3–5, bilobed; flowers yellow, very large; large climbing hispid or hairy herbs; seeds compressed **Cucurbita.**

Anther-cells straight or curved, not flexuose:—

Disk around the style annular or cupular; tendrils simple, rarely bifid; seeds ovoid or subglobose, smooth or rugose, usually compressed and margined........................ ... .9. **Melothria.**

Disk around the style 0 or obscure; tendrils simple:—

Stamens inserted on the tube of the calyx:—

Petiole of leaf with a stipuliform bract; seeds marginate, hollowed on one side, convex on the other; connective of anthers not produced at apex ....10. **Blastania.**

Petiole of leaf not stipulate; connective of anthers produced at apex:—

Fruit indehiscent; seeds marginate, smooth 11. **Kedrostis.**

Fruit circumsciss near the base; seeds appressed-pilose, not marginate, scarcely compressed......12. **Corallocarpus.**

Stamens inserted on the mouth of the calyx-tube; fruit depressed-globose; seeds ovoid, smooth, marginate 13. **Cerasiocarpum.**

Ovules pendulous:—

Leaves pedate with 3–5 leaflets; tendrils simple; seeds verrucose, not winged; slender climbers ....14. **Gynostemma.**

Leaves simple; tendrils simple or bifid; seeds compressed, with a broad membranous wing; scandent shrubs................15. **Zanonia.**

1. Trichosanthes, Linn.

Herbaceous climbers. *Leaves* entire or palmately lobed rarely pinnate, denticulate; tendrils simple or 2–5-fid. *Flowers* dioecious, rarely monoecious, white; ♂ usually racemose, bracteolate; ♀ solitary. *Calyx*-tube long, cylindric, dilated above; lobes 5, entire serrate or laciniate. *Petals* 5, connate at the base, margins long-fimbriate. *Stamens* 3, inserted in the calyx-tube; filaments very short; anthers connate, 2 2-celled, the third 1-celled, the cells conduplicate; in ♀ flowers staminodes 0. *Ovary* inferior, ovoid or fusiform, 1-celled with 3 parietal placentas; ovules very many, usually horizontal; style slender; stigmas 3, entire or bifid; in ♀ flowers pistillodes 0. *Fruit* a glabrous ovoid or fusiform indehiscent berry, usually smooth. *Seeds* many, embedded in pulp, ellipsoid or angular.

Female flowers without or with very small bracts :—
- Leaves entire, cordate, distantly denticulate, prominently reticulate :—
  - Male racemes few-flowered, straight; calyx-teeth short, lanceolate 1. *nervifolia.*
  - Male racemes many-flowered, geniculate; calyx-teeth elongate, subulate..2. *cuspidata.*
- Leaves lobed :—
  - Male racemes without bracts; leaves deeply and usually acutely lobed, denticulate, the end teeth subulate; fruit ovoid-fusiform, short ....3. *cucumerina.*
  - Male racemes with very small bracts :—
    - Pedicels much shorter than the flowers; lobes of the leaves rounded, very faintly denticulate; fruit very long, narrow, twisted.. *anguina.*
    - Pedicels longer than the flowers :—
      - Leaves glabrous on both sides, 3-lobed, with distant subulate teeth; petals rather shortly fimbriate ....4. *Perrottetiana.*
      - Leaves densely villous beneath, 5–7-lobed, with shallow sinuses and subulate teeth; petals long-fimbriate, the inflorescence and petiole very villous ....5. *villosula.*
  - Male racemes with large bracts, the bracts broad, laciniate :—
    - Calyx-lobes shortly dentate; leaves very variable, usually scabrous and often deeply lobed ....6. *palmata.*

Calyx-lobes deeply divided, the divisions subulate ; leaves soft, not deeply lobed and hardly scabrous .... 7. *Lepiniana.*

Female flowers bracteate, either few with lanceolate bracts or many with laciniate bracts ; leaves 3–5-lobed, very scabrous above, pubescent beneath, irregularly and deeply serrate .. .. .8. *anamalayana.*

1. TRICHOSANTHES NERVIFOLIA, Linn. ; F. B. I. ii. 609, *in part* ; W. & A. 349.

   W. Gháts, in Coorg, Nilgiris and Pulneys, at low levels.

   A slender twining herb with reticulate leaves and ovoid acute fruit, green with white lines, afterwards red above, the seeds flattened with angular projections on the margins, the faces rugose.

2. TRICHOSANTHES CUSPIDATA, Lamk. ; W. & A. 349. *T. nervifolia*, Linn. ; F. B. I. ii. 609, *in part.*

   W. Coast, in Travancore and Malabar.

   A slender twiner with reticulate leaves and characteristically geniculate zig-zag racemes.

3. TRICHOSANTHES CUCUMERINA, Linn. ; F. B. I. ii. 609 ; W. & A. 350. *T. lobata*, Roxb. ; F. B. I. ii. 610.

   Deccan and W. Coast, in plains country and in lower hills.

   A slender annual climber with rather shortly laciniate small white flowers, deeply 5-lobed leaves and an ovoid fusiform fruit, green and striped when fresh, scarlet or orange when ripe, up to 3 in. long.

4. TRICHOSANTHES PERROTTETIANA, Cogn. Monog. 362.

   Carnatic, at Pondicherry (Perrottet, *from description*).

   A slender climber with 3-lobed leaves and deep basal sinus, the racemes slender, long-peduncled.

5. TRICHOSANTHES VILLOSULA, Cogn. Monog. 362.

   W. Gháts, in the Nilgiri Hills at 5,000–6,000 ft.

   A rather stout herbaceous climber with conspicuously villous stems, petioles and inflorescence and very long laciniae to the petals of the rather large white flowers ; the fruit ovoid, acuminate, 2·5 in. long.

6. TRICHOSANTHES PALMATA, Roxb. ; F. B. I. ii. 606 ; W. & A. 350 ; Wt. Ill. tt. 104, 105. *T. bracteata*, Voigt ; Cogn. Monog. 375.

   W. Gháts, in all Districts, up to 5,000 ft., common.

   A large woody climber with palmate deeply-lobed but very variable leaves, scabrous-dotted above, conspicuous large

bracts and a large globose red orange-streaked fruit, not edible. Vern. *Tam.* Anacoruthay; *Tel.* Abuva.

Var. *tomentosa*, Heyne; F. B. I. ii. 607. Leaves much less lobed, scarcely scabrous, tomentose beneath; bracts and calyx-lobes more deeply laciniate.

W. Gháts, in the Mysore Hills, Pulneys and Nilgiris at about 3,000–6,000 ft.

7. TRICHOSANTHES LEPINIANA, Cogn. Monog. 377.

Carnatic, at Pondicherry (Lépine); W. Gháts, in the Nilgiris and Pulneys.

A large strong-growing climber with palmately 3–5-lobed leaves and deeply laciniate calyx-lobes.

8. TRICHOSANTHES ANAMALAYANA, Bedd.; Cogn. Monog. 378.

W. Gháts, in the Anamalai Hills at 4,000 ft. (Bedd. *from description*).

Apparently a large species but very little known.

Trichosanthes Anguina, Linn., is the Snake Gourd cultivated for its long twisted fruit, which may reach 3 ft. in length and 3 in. in diam. and is used as a vegetable. In leaves and flowers it greatly resembles *T. cucumerina*. Vern. *Hind.* Chachinda.

2. Gymnopetalum, Arn.

Twining slender pubescent or scabrous herbs; tendrils usually simple. *Leaves* cordate, 5-angular or 3–5-lobed. *Flowers* white or yellow, dioecious or monoecious, ♂ solitary or racemose, ♀ solitary. *Calyx*-tube elongate, tubular, contracted near the mouth; lobes 5, subulate. *Corolla* rotate, deeply 5-partite, the lobes oblong or obovate. *Stamens* 3, included, inserted on the middle of the calyx-tube; filaments short, free; anthers 3, connate, 1 1-celled, the others 2-celled, the cells linear, longitudinally conduplicate; in ♀ staminodes 3, minute or 0. *Ovary* ovoid or oblong; ovules numerous, on 3 placentas; style filiform; stigmas 3, linear; in ♂ pistillodes 1–3, subulate. *Fruit* an ovoid oblong berry acute at both ends. *Seeds* many or few, obovoid or oblong, compressed, marginate, nearly smooth.

GYMNOPETALUM WIGHTII, Arn.; F. B. I. ii. 611; Trim. Fl. Ceyl. t. 43. *G. tubiflorum*, Cogn. Monog. 388. *Bryonia tubiflora*, W. & A. 347.

W. Coast from S. Canara (Hohenacker) to Travancore; W. Gháts, in the Anamalai Hills at 3,000 ft. (Gamble).

A very slender climber with yellow flowers and membranous leaves, the seeds oblong, truncate at the ends.

3. Momordica, Linn.

Climbing annual or perennial herbs; tendrils simple. *Leaves* entire, lobed or pedately 3–7-foliolate. *Flowers* yellow or white, monoecious or dioecious, the ♂ solitary or racemed, the ♀ solitary; bracts present or 0, usually on the peduncle. *Calyx*-tube short, campanulate; lobes 5, ovate. *Petals* 5, shortly connate below, the corolla rotate or campanulate. *Stamens* 3, rarely 2; filaments short; anthers at length free, 1 1-celled, the others 2-celled, the cells conduplicate or rarely horseshoe-shaped; in ♀ flowers staminodes 0 or of 3 glands. *Ovary* oblong, 1-celled; ovules many, horizontal, on 3 vertical placentas; style long; stigmas 3; in ♂ flowers pistillode 0 or glandular. *Fruit* an oblong or spherical, smooth or rough berry or a 3-valved capsule. *Seeds* many or few, obovate or flattened, smooth or variously sculptured.

Male flowers solitary:—
- Flowers monoecious; flower-peduncles bracteate at the middle or near the base; leaves orbicular-reniform, deeply pedately 5–7-lobed; fruit fusiform, rostrate, tuberculate; seeds compressed, subrectangular, rugose on the faces ....1. *Charantia.*
- Flowers dioecious; bract near the top of the peduncle:—
  - Petioles without glands:—
    - Calyx-lobes linear-lanceolate, acute; leaves ovate, cordate, entire or somewhat 3–5-lobed; fruit ellipsoid with soft spines 2. *dioica.*
    - Calyx-lobes ovate-oblong, obtuse; leaves broadly ovate, deeply cordate, entire or somewhat 3–5-lobed; fruit ellipsoid, densely softly echinate ....3. *subangulata.*
  - Petioles glandular; calyx-lobes lanceolate, acute; leaves large, palmate, cordate, usually 3-lobed; fruit ovoid with raised points 4. *cochinchinensis.*

Male peduncles 2–5-flowered; flowers monoecious; bract at the top of the peduncle in ♂, near the middle in ♀; calyx-lobes lanceolate, acute; leaves orbicular, reniform, deeply cordate, shortly 5–7-lobed; fruit pyriform or fusiform; seeds broadly ovoid, smooth ... 5. *tuberosa.*
Male peduncles many-flowered; flowers dioecious; bract very small, towards the base of the peduncle in ♀, near the middle in ♂; calyx-lobes lanceolate; leaves ovate-cordate, denticulate, about 4 in. by

3 in., 5–7-lobed, the end lobes long and acute; fruit ovoid, rostrate, covered with triangular papillae ....6. *denudata.*

1. MOMORDICA CHARANTIA, Linn.; F. B. I. ii. 616; W. & A. 348; Wt. Ic. t. 504.

All plains Districts, cultivated and commonly found run wild.

A slender twining annual herb with pale yellow flowers and an edible fruit of a bright orange colour, with crimson pulp, and covered with raised tubercles. Vern. *Hind.* Karéla; *Tam.* Pava kai.

2. MOMORDICA DIOICA, Roxb.; F. B. I. ii. 617; W. & A. 348; Wt. Ic. tt. 505, 506.

Plains Districts of the Carnatic and W. Coast, in the hills up to 4,000 ft.

A perennial tuberous-rooted climber with yellow flowers and an orange-coloured muricate fruit, up to about 2 in. long, sometimes eaten, as are the tubers. Vern. *Tel.* Puagakara.

3. MOMORDICA SUBANGULATA, Bl.; Cogn. Monog. 443.

W. Gháts, from S. Canara to Wynaad, up to 3,000 ft.

A pretty climber with large yellowish petals conspicuously veined.

4. MOMORDICA COCHINCHINENSIS, Spr.; F. B. I. ii. 618. *M. mixta*, Roxb.; W. & A. 349.

Deccan and W. Gháts, in S. Canara and Mysore.

A handsome large climber with large petals, creamy-white tinged with yellow, and black claws; fruit bright red, ovoid, 4–5 in. long, covered with conical points, seeds very large.

5. MOMORDICA TUBEROSA, Cogn. *M. Cymbalaria*, Fenzl; F. B. I. ii. 618. *Luffa tuberosa*, Roxb.; W. & A. 1068.

Deccan and Carnatic, in Mysore, Bellary and Anantapur and down to Tinnevelly, on black cotton soil.

A trailing plant with herbaceous shoots from a large tuberous rootstock, petals white, tinged pale yellow, fruit dark green and ribbed, about 1 in. long, said to be edible.

6. MOMORDICA DENUDATA, Thw.; F. B. I. ii. 618.

W. Coast, at Quilon in Travancore (Wight).

A slender climber with membranous leaves.

4. **Luffa,** Tourn.

Annual climbing herbs, large or small; tendrils 2–5-fid. *Leaves* 5–7-lobed, rarely subentire; petiole not glandular at the apex. *Flowers* monoecious, yellow or white; ♂ flowers in racemes, ♀ flowers solitary, both often from the same axil. *Calyx*-tube in ♂ turbinate or campanulate, in ♀ produced beyond the ovary; lobes 5, triangular or lanceolate. *Petals* 5, free, spreading, obovate or obcordate. *Stamens* 3, less often 4 or 5, inserted on the calyx-tube; filaments free or connate; anthers exserted, free, 1 1-celled, the others 2-celled, the cells sigmoid, often on a broad connective; in ♀ flowers staminodes 3 or more, thick. *Ovary* oblong, 1-celled; ovules many, horizontal, on 3 parietal placentas; style cylindric; stigma 3-lobed; in ♂ flowers pistillode 0 or glandular. *Fruit* a large or small oblong or cylindric, smooth or angled or spinous, fibrous berry, usually dehiscing by a circumsciss opening at the top with a stopple. *Seeds* many, oblong, compressed.

Stamens 5; fruit large, cylindric, 5–12 in. long, smooth, 10-ribbed or somewhat 10 angled; seeds narrowly winged, smooth on sides; leaves orbicular-reniform, palmately 5-lobed, scabrous and punctate; petals obtuse .... 1. *aegyptiaca.*

Stamens 3:—

Fruit oblong-clavate with 10 sharp angles; seeds not winged, slightly rugose on the sides; leaves orbicular-cordate, palmately 5–7-lobed, scabrous; petals emarginate .... 2. *acutangula.*

Fruit small, spinous, the spines woolly; seeds thinly verrucose; leaves ovate-cordate, slightly 3–5-lobed, scabrous ....3. *umbellata.*

1. Luffa aegyptiaca, Mill.; F. B. I. ii. 614. *L. pentandra*, Roxb.; W. & A. 343; Wt. Ic. t. 499.

All plains Districts, especially near the coast, cultivated and run wild, but doubtfully indigenous.

A large climbing plant with smooth fruit, edible when young, and when old the fibrous skeleton forms a flesh-brush "loofa." Vern. *Hind.* Ghia taroi.

2. Luffa acutangula, Roxb.; F. B. I. ii. 713. *L. amara*, Roxb.; W. & A. 343.

Most plains Districts, especially near the E. Coast, not common.

A climber with angular fruit, and usually (var. *amara*,

C. B. Clarke) with scabrous and pubescent leaves, the fruit small.

3. LUFFA UMBELLATA, Roem. *L. Kleinii*, W. & A. 344; F. B. I. ii. 616.

W. Coast, in Travancore, scarce.

A slender branching climber.

5. **Bryonopsis**, Arn.

Annual scaberulous scandent herbs; tendrils 2-fid. *Leaves* deeply palmately 5-lobed. *Flowers* monoecious, ♂ and ♀ fascicled, often in the same axils. *Calyx*-tube broadly campanulate; lobes 5, subulate. *Corolla* campanulate, 5-partite; lobes ovate. *Stamens* 3, free, inserted on the tube of the calyx; filaments short; anthers cohering, 1 1-celled, 2 2-celled, the cells linear, flexuose round the broad connective not produced at the apex; staminodes in ♀ 3, small. *Ovary* globose or ovoid; ovules numerous, horizontal, on 3 placentas; style slender; stigmas 3, papillose, deeply 2-lobed; pistillodes in ♂ flowers 0. *Fruit* a spherical or ovoid-conical pulpy many-seeded berry. *Seeds* pyriform, surrounded by a thick grooved crenulate ring on either side of which project the swollen faces of the seed.

BRYONOPSIS LACINIOSA, Naud. *Bryonia laciniosa*, Linn.; F. B. I. ii. 622; W. & A. 345; Wt. Ic. t. 500.

Most Districts, in hedges and on bushes, up to 4,000 ft. in the hills.

A slender climbing annual from a thick permanent rootstock, stems angular; berries conspicuous, ·5 to 1 in. in diam., brick-red when ripe with white vertical lines.

6. **Cucumis**, Linn.

Annual herbs or with a perennial root, climbing or trailing, hispid or scabrous; tendrils simple. *Leaves* entire or palmately 3–7-lobed or 5-angled, dentate or serrate. *Flowers* yellow, monoecious, short-peduncled, ♂ in clusters in the axils, ♀ solitary. *Calyx*-tube turbinate or campanulate; lobes 5. *Corolla* campanulate; lobes 5, oblong or ovate, acute. *Stamens* 3, free, 1 1-celled, 2 2-celled, the cells conduplicate, the connective produced above in a crest; in ♀ flowers staminodes 3, setiform or ligulate. *Ovary* in ♂ a broad gland-like pistillode, in ♀ ovoid or globose; ovules

many, horizontal, on 3 vertical placentas; style short; stigmas 3, obtuse; in ♂ flowers pistillode glandular. *Fruit* a large or small, spherical or elongate, smooth or tuberculate or spinous berry, indehiscent. *Seeds* very many, oblong or elliptic, compressed, usually smooth.

Fruit smooth, glabrous or pubescent; leaves suborbicular-reniform, cordate at base; ovary densely softly villous:—
  Annual; leaves shallowly 5-angled or slightly lobed, softly villous; ♂ flowers in clusters:—
    Fruit ovoid, obtuse at both ends, 1–1·5 in. long; leaves rather small, thick ... ... 1. *pubescens.*
    Fruit globose ovoid or elongate, large; leaves large and thin *Melo.*
  Perennial; leaves deeply palmately 5-lobed, scabrous; ♂ flowers usually solitary ... ... 2. *trigonus.*
Fruit softly spinous; perennial trailing herb with cinereous very scabrid leaves ... ... 3. *prophetarum.*
Fruit with few scattered tubercular prickles, cylindric, yellowish-green; ♂ flowers in fascicles; leaves with angular lobes ... ..*sativus.*

1. Cucumis pubescens, Willd.; W. & A. 342; Wt. Ic. t. 496; *C. trigonus*, Roxb.; F. B. I. ii. 619, *in part.*
   E. Coast Districts, on waste ground.
   A climbing or trailing plant, the fruit ovoid, striped dark and light green.
2. Cucumis trigonus, Roxb.; F. B. I. ii. 619, *in part*; W. & A. 342; Wt. Ic. t. 497.
   Deccan and Carnatic, in dry Districts.
   A prostrate plant from a perennial rootstock, the fruit yellow or yellow with green stripes.
3. Cucumis prophetarum, Linn; F. B. I. ii. 619; W. & A. 342.
   Deccan, in dry Districts, Bellary (Gamble), apparently on black cotton soil.
   A trailing very scabrous plant with subglobose spinous fruit striped green and white.

Cucumis Melo, Linn., the Melon, is largely cultivated on the sandy beds of rivers when the stream has subsided to its hot season channel. Vern. *Hind.* Kharboj.

Cucumis sativus, Linn., the Cucumber, is grown in gardens as a vegetable. Vern. *Hind.* Khira.

7. Citrullus, Neck.

Trailing herbs, hispid or scabrous; tendrils 2–3-fid. *Leaves* triangular-ovate, deeply 3–5-lobed, the midlobe elongate, all sinuately pinnatifid. *Flowers* monoecious, yellow, both ♂ and ♀ solitary, rather large. *Calyx*-tube broadly campanulate, lobes 5. *Corolla* usually rotate, the petals ovate or obovate, obtuse or emarginate. *Stamens* 3; filaments short, free; anthers free or slightly cohering, 1 1-celled, 2 2-celled, the cells linear flexuous, the connective not produced; in ♀ flowers staminodes 3, setiform or ligulate. *Ovary* ovoid, 1-celled; ovules many on 3 vertical placentas; style short; stigmas 3, thick, reniform; in ♂ flowers pistillode glandular. *Fruit* a globose or oblong fleshy, or dry, indehiscent berry. *Seeds* very many, elliptic-oblong, compressed, smooth.

Perennial; fruit globose, up to 3 in. in diam., very bitter; leaf-lobes narrow, thick..1. *Colocynthis.*
Annual; fruit oblong or ellipsoid, up to 10 in. in diam., edible; leaf-lobes broad, thin ....*vulgaris.*

Citrullus Colocynthis, Schrad.; F. B. I. ii. 620; Wt. Ic. t. 498. *Cucumis Colocynthis,* Linn.; W. & A. 342.

Deccan, on dry sandy or stony lands.

A trailing scabrid herb with much cut leaves and globular fruit variegated dark-green and white, the pulp of which affords an important purgative medicine. Vern. *Hind.* Indrawan; *Tel.* Patsa kaya.

C. vulgaris, Schrad., is the Water Melon, sometimes grown on the sandy beds of rivers for its refreshing fruit. It comes from Tropical Africa. Vern. *Hind.* Tarbuj.

8. Coccinia, W. & A.

Slender scandent or prostrate herbs; roots sometimes tuberous; tendrils simple. *Leaves* petiolate, deltoid or subrotund, angled or lobed, sometimes glandular beneath. *Flowers* rather large, white or yellow, dioecious, ♂ solitary or subcymose, ♀ solitary. *Calyx*-tube campanulate, short; lobes 5. *Corolla* campanulate, shortly 5-fid. *Stamens* 3; filaments connate in a column, rarely free; anthers connate, 1 1-celled, 2 2-celled, cells conduplicate; in ♀ flowers staminodes 3, oblong or subulate. *Ovary* ovoid,

oblong or linear; ovules very many, horizontal, from 3 placentas; style slender; stigmas 3; pistillode in ♂ flowers 0. *Fruit* an ovoid or oblong indehiscent berry. *Seeds* ovoid, compressed, margined, the testa smooth velvety or scorbiculate.

Coccinia indica, W. & A. 347; Wt. Ill. t. 105. *Cephalandra indica*, Naud.; F. B. I. ii. 621.

Most plains Districts, especially in the Deccan and Carnatic, on hedges and bushes.

A pretty climber with large white flowers and oblong scarlet fruit with velvety seeds, the leaves variable, generally 5-angled with shallow sinuses, but sometimes even on the same plant (var. *palmata*, W. & A.) deeply 5-lobed. The fruit is sometimes eaten. Vern. *Hind.* Bhimb; *Tel.* Kaidonda; *Tam.* Kovay.

9. **Melothria**, Linn.

Slender scandent or prostrate herbs, annual or with a perennial root stock; tendrils simple, rarely bifid. *Leaves* usually membranous, entire or lobed. *Flowers* small, monoecious or dioecious, yellow or white; ♂ in racemes, corymbs or umbels, sometimes fascicled, rarely solitary; ♀ solitary fascicled or in umbels. *Calyx* campanulate; lobes 5. *Corolla* deeply 5-partite, the lobes entire. *Stamens* 3, inserted on the tube, rarely at the base, of the calyx; filaments free; anthers free or slightly cohering, 1 1-celled the others 2-celled, or all 2-celled, the cells straight or curved, the connective sometimes produced; in ♀ flowers staminodes 3 or 0. *Ovary* ovoid globose or fusiform, constricted below the flower; ovules usually many, on 3 placentas; style short, surrounded by an annular disk; stigmas 3, rarely 2; in ♂ flowers pistillodes globose or annular. *Fruit* a globose ovoid or fusiform berry, many- or few-seeded. *Seeds* ovoid or subglobose, usually compressed and margined, smooth or rugose.

Flowers usually monoecious, ♂ in racemes, ♀ solitary; anthers subsessile; leaves deltoid, acute or acuminate, up to 2 in. long, 2–2 5 in. broad, membranous, punctate; fruit fusiform, rostrate; seeds smooth, truncate at base, not marginate ....1. *zeylanica.*

Flowers monœcious or dioecious, ♂ usually umbellate, ♀ solitary or umbellate; filaments long, the connective not produced :—

Seeds small, much compressed; leaves membranons, simple or 3–5-lobed :—

Flowers monoecious; leaves usually rufous-villous beneath, the teeth very short; berry globose, ·25 in. in diam.; seeds smooth, faintly marginate . . .. 2. *perpusilla.*

Flowers dioecious; leaves nearly glabrous beneath, the teeth triangular; berry oblong, ·6 in. long, ·3 in. broad; seeds marginate .... 3. *mucronata.*

Seeds large, globose, scarcely compressed; leaves subcoriaceous, variable in shape:—

Flowers dioecious; leaves cordate, ovate or 3–5-lobed or hastate, the lobes sometimes long, prominently nerved; fruit oblong, ribbed, up to 2·5 in. long; seeds smooth on the faces, the broad ring rugose ... . 4. *heterophylla.*

Flowers monoecious; leaves deeply cordate or sagittate, not lobed though often angulate, prominently nerved; fruit ovoid, beaked, up to 1 in. long; seeds smooth on the faces, nearly so on the flat ring .. .. 5. *amplexicaulis.*

Flowers monoecious, ♂ fascicled, ♀ solitary; anthers subsessile, the connective apiculate; fruit small, globose, subsessile; seeds marginate, slightly flattened, ·15 by ·1 in.; leaves and stems more or less scabrous:—

Seeds smooth on the faces; leaves beneath densely softly villous-tomentose ....6. *leiosperma.*

Seeds rugose on the faces; leaves beneath shortly hirsute or scabrous .... 7. *maderaspatana.*

1. Melothria zeylanica, C. B. Clarke in F. B. I. ii. 626.
   W. Ghâts, in Wynaad and Pulney Hills, at about 3,000 ft.
   A pretty, very slender climber, the flowers and fruit on long slender pedicels.

2. Melothria perpusilla, Cogn. *Zehneria Hookeriana*, Arn.; F. B. I. ii. 624. *Bryonia Hookeriana*, W. & A. 345. *B. maysorensis*, Wt. Ic. t. 758.
   Deccan, Horsleykonda at 4,000 ft. (Fischer); W. Ghâts, in the Nilgiris and Pulneys, up to 6,000 ft.; Shevaroy Hills of Salem.
   A slender climber with small globose berries, red when ripe, and greenish-yellow flowers. The var. *subtruncata*, Cogn., has the leaves nearly truncate at base.

3. Melothria mucronata, Cogn. *Zehneria Baueriana*, C. B. Clarke; F. B. I. ii. 624. *Bryonia maysorensis*, W. & A. 345; Wt. Ic. t. 1609 (but not dioecious).

W. Gháts, in the Nilgiris, Pulneys and Sirumalai Hills, up to 7,000 ft.

A slender climber with oblong berries, apparently yellow when ripe.

4. MELOTHRIA HETEROPHYLLA, Cogn. *Zehneria umbellata*, Thw.; F. B. I. ii. 625 *in part*. *Bryonia umbellata*, Klein; W. & A. 345.

E. Gháts, Madgol Hills of Vizagapatam, at 5,000 ft.; Deccan, in the hills; W. Gháts, at low levels and up to 5,000 ft. W. Coast, from S. Canara southwards.

A climber from a perennial root, with polymorphic leaves and large fruit, red and often yellow-spotted or -striped when ripe, the small flowers yellowish-white.

5. MELOTHRIA AMPLEXICAULIS, Cogn. *Bryonia amplexicaulis*, W. & A. 346; Wt. Ic. t. 502.

Deccan, Carnatic and W. Coast, not common.

A climber with more or less amplexicaul coriaceous leaves and scrobiculate seed, very nearly allied to and difficult to distinguish from the preceding species

6. MELOTHRIA LEIOSPERMA, Cogn. *Mukia leiosperma*, Wt.; F. B. I. ii. 623. *Bryonia leiosperma*, W. & A. 345.

W. Gháts, in the Nilgiris and Pulneys, up to 6,000 ft.

A hispid, very villous small climber.

7. MELOTHRIA MADERASPATANA, Cogn. *Mukia scabrella*, Arn.; F. B. I. ii. 623. *Bryonia scabrella*, Linn. f.; Wt. Ic. t. 501.

Most Districts of the Deccan. Carnatic and lower hills of W. Gháts.

A scabrous climber with small yellow flowers, the berries red when ripe, the leaves variable in shape.

10. **Blastania,** Kotschy & Peyr.

Prostrate or scandent annual herbs, drying black; tendrils simple. *Leaves* digitately 5–7-lobed or -partite; in each axil a broad, rounded, stipuliform, pectinate bract. *Flowers* minute, monoecious, ♂ racemose, on slender pedicels; ♀ solitary in the same axils. *Calyx*-tube short, campanulate; lobes 5, very small, subulate. *Corolla* rotate, deeply 5-partite. *Stamens* 3, inserted on the calyx-tube, free; anthers small, 1 1-celled, the rest 2-celled, the cells short, straight, connective not produced; staminodes

in ♀ 0. *Ovary* ovoid; ovules few, horizontal, on 2–3 placentas; style columnar; stigmas 2, rarely 3; pistillode in ♂ flowers 0. *Fruit* a fleshy globose or subquadrate berry. *Seeds* usually 2 or 3, marginate, obovate, hollowed on one side, convex on the other, the testa smooth.

BLASTANIA GARCINI, Cogn. *Ctenolepis Garcini*, Hook. f.; F. B. I. ii. 629. *Bryonia Garcini*, Willd.; W. & A. 344.

N. Circars, Deccan and Carnatic, extending westwards to the Ghâts.

A slender pretty annual climber with orange or red fruit.

11. Kedrostis, Medikus.

Prostrate or scandent herbs, with a perennial rootstock; tendrils simple. *Leaves* entire or lobed, dentate or partite. *Flowers* small, yellow or greenish, monoecious, rarely dioecious; ♂ racemose or corymbose; ♀ solitary or aggregated, shortly pedicelled. *Calyx*-tube campanulate; lobes 5, short. *Corolla* rotate, 5-partite. *Stamens* 3, rarely 5, inserted in the calyx-tube; filaments short; anthers short, 1 1-celled, the others 2-celled or all 1-celled if 5; cells straight or curved; connective produced above the cells, usually bifid; staminodes in ♀ 0 or 3, very small. *Ovary* ovoid, beaked, with 2–3 placentas; ovules few; style sometimes surrounded by a disk; stigmas 2 or 3; pistillode in ♂ 0 or glandular. *Fruit* an ovoid, usually rostrate berry. *Seeds* few, tumid, marginate, testa smooth.

KEDROSTIS ROSTRATA, Cogn. *Rhynchocarpa foetida*, C. B. Clarke; F. B. I. ii. 627. *Bryonia rostrata*, Rottl.; W. & A. 346.

Carnatic (Wight, Rottler).

A prostrate or scandent herb with orbicular or reniform leaves, small flowers and an ovoid, beaked, red fruit.

12. Corallocarpus, Welw.

Prostrate or climbing herbs; tendrils simple. *Leaves* roundish-cordate, lobed or palmate, rather thick. *Flowers* minute, monoecious, ♂ in small crowded racemes on long peduncles, ♀ solitary short-peduncled from the same axils. *Calyx*-tube campanulate; lobes 5, short. *Corolla* 5-partite; lobes ovate. *Stamens* 3, free, inserted on the calyx-tube; filaments very short; anthers all

2-celled or 1 1-celled, the cells straight, lateral on the thin connective, which is often produced and sometimes bifid above; in ♀ staminodes 0 or minute. *Ovary* ovoid, beaked, 2–3-celled; ovules few, on 2–3 placentas; style straight, without disk; stigma 3-, rarely 2–4-lobed; in ♂ flowers pistillode minute. *Fruit* an ovoid usually beaked fleshy berry, circumscis near the base. *Seeds* few obovoid or subglobose, often appressed-pilose, very little compressed.

Peduncles of ♀ flowers thickened, also of ♂, which reach 3 in. long; tendrils stout; leaves rather thick, deeply 3–5-lobed ...... 1. *epigaeus*.
Peduncles of ♀ flowers very slender, also of ♂, which reach 1–5 in. long; tendrils capillary; leaves thin, 3-lobed .... 2. *gracilipes*.

1. CORALLOCARPUS EPIGAEUS, Hook. f.; F. B. I. ii. 628. *Bryonia epigaea*, Rottl.; W. & A. 346; Wt. Ic. t. 503.
   Deccan and Carnatic and westward to the lower hills of the Ghâts, in dry country.
   A thick-stemmed climber from a large tuberous rootstock, the leaves rough and variable in their lobes, the fruit scarlet in the middle, the base and beak green.
2. CORALLOCARPUS GRACILIPES, Cogn. Monog. 650.
   Carnatic, Near Pondicherry (Lépine).
   A very slender climber.

13. **Cerasiocarpum,** Hook. f.

Climbing glabrous herbs; tendrils simple. *Leaves* oblong, cordate at base, entire or hastately 3-lobed. *Flowers* small, monoecious; ♂ in racemes; ♀ solitary, often from the same axils. *Calyx*-tube campanulate; lobes 5, minute. *Corolla* rotate, 5-partite, the lobes ovate. *Stamens* 3, free, inserted on the mouth of the calyx-tube; filaments very short, broad; anthers 1 1-celled, 2 2-celled; cells oblong, lateral on the connective, which is membranous and often produced; staminodes in ♀ 0. *Ovary* ovoid, 1-celled, with 2–3 placentas; ovules 4–6; style columnar; stigma 3-lobed; in ♂ pistillode 0. *Fruit* a depressed globose smooth fleshy indehiscent berry. *Seeds* 2–6 broadly ovoid, not compressed, marginate, surrounded by orange pulp.

CERASIOCARPUM BENNETTII, Cogn. *C. zeylanicum*, Hook. f.; F. B. I. ii. 629; Trim. Fl. Ceyl. t. 44.

W. Gháts, in S.-E. Wynaad, near Devala, at 3,000 ft. (Gamble).

A pretty climber with membranous leaves up to 5 in. long, 2·5 in. broad, dentate and acuminate, sometimes hastate at base, the fruit bright orange-red.

14. **Gynostemma,** Blume.

Slender climbing herbs; tendrils simple. *Leaves* pedately 3–7-foliolate, leaflets ovate-lanceolate. *Flowers* minute, white or greenish, dioecious or rarely monoecious, in diffuse axillary panicles; pedicels articulate, bracteolate. *Calyx* rotate, 5-partite; lobes short. *Corolla* rotate, 5-partite; lobes lanceolate. *Stamens* 5, inserted at the bottom of the calyx; filaments connate in a column below; anthers 2-celled; staminodes in ♀ 0. *Ovary* spherical, 2–3-celled; ovules 2 in each cell, pendulous; styles 2–3, bifid at tip; pistillodes in ♀ 0. *Fruit* a globose, indehiscent, 1–3-seeded berry. *Seeds* ovoid or triangular, flattened, verrucose.

Gynostemma pedata, Blume; F. B. I. ii. 633; Trim. Fl. Ceyl. t. 45.

W. Gháts, Nilgiri Hills at 4,000–6,000 ft.; hills of Tinnevelly (Beddome).

A slender climber with long flower- and fruit-panicles, the leaflets vine-like, crenate-serrate, the berry greenish.

15. **Zanonia,** Linn.

Scandent shrubs; tendrils simple or bifid at the apex. *Leaves* petiolate, ovate or oblong, entire. *Flowers* small, dioecious, all racemose or the ♂ panicled. *Calyx* of 3, rarely 4, sepals, broadly oblong or orbicular, membranous, concave. *Corolla* rotate, 5-partite, coriaceous or fleshy; lobes narrowed at the apex. *Stamens* 5, free, inserted on a fleshy disk; filaments very short and thick; anthers transversely oblong, 1-celled; staminodes in ♀ short, alternate with the petals. *Ovary* elongate, at first 3-celled, later 1-celled by absorption of the septa; ovules 2–many in each cell, on parietal placentas, pendulous; styles 3, bifid at apex; pistillode in ♂ 0. *Fruit* cylindric clavate or hemispheric, terete or subtrigonous, truncate and broadly 3-valved at apex. *Seeds* large, pendulous, oblong, compressed, imbricate, surrounded by a broad membranous wing.

ZANONIA INDICA, Linn.; F. B. I. ii. 633; W. & A. 340; Wt. Ill. t. 103 (but not monoecious).

W. Ghâts, in the Bababudan Hills of Malabar.

A stout climbing shrub with large ovate-cordate leaves and winged seeds.

Lagenaria vulgaris, Ser., is the Bottle Gourd, cultivated for its fruit, which has various shapes and is eaten when young, and when old and the shell has dried used for bottles and to make musical instruments. Vern. *Hind.* Kaddu.

Benincasa cerifera, Savi, is the White Gourd Melon, occasionally cultivated for its fruit, which is large and fleshy and covered with a waxy bloom. The seeds, which are compressed and marginate, yield an oil. Vern. *Hind.* Gol kaddu.

Cucurbita maxima, Duch., the Squash-Gourd, *C. Pepo*, DC., the Pumpkin, *C. ovifera*, Linn. the Vegetable Marrow, and *C. moschata*, Duch., the Musk Melon, are all large-fruited large climbing or trailing herbs cultivated for their fruits.

Family LXXIV. DATISCACEAE.

Trees or herbs. *Leaves* petioled, simple or pinnate, alternate; stipules 0. *Flowers* small, regular, dioecious or rarely bisexual, in fascicles racemes or panicles. *Calyx*-tube in ♂ short; in ♀ adnate to the ovary; lobes 3–9. *Petals* 0. *Stamens* 4 or more, usually opposite the calyx-lobes; filaments short, anthers 2-celled, in ♀ if present reduced to staminodes. *Ovary* 1-celled, open or closed at the apex; placentas parietal; ovules numerous, ascending or horizontal; styles as many as the placentas and alternate with them, simple or 2-partite. *Fruit* a coriaceous or membranous capsule, dehiscing at the apex between the styles. *Seeds* very many, minute; albumen scanty; embryo straight.

Tetrameles, R. Br.

Large tree. *Leaves* deciduous, ovate, acuminate, pubescent beneath. *Flowers* dioecious, appearing before the leaves; ♂ in panicles, ♀ in racemes, clustered near the ends of the branches. *Calyx*-tube in ♂ very short, in ♀ connate with the ovary; lobes 4. *Stamens* 4, opposite the calyx-lobes, inserted round a flat central disk. *Ovary* inferior, 1-celled; ovules numerous on 4 parietal placentas; styles 4, subulate; stigmas club-shaped.

Capsule ovoid, membranous, 4–8-ribbed, dehiscing at the apex. *Seeds* very many, minute, ellipsoid; testa very loose, reticulate, membranous.

TETRAMELES NUDIFLORA, R. Br.; F. B. I. ii. 657; Bedd. Fl. t. 212. *T. Grahamiana,* Wt Ic. t. 1956.

W. Coast and W. Gháts, in low level forests both evergreen and deciduous, up to 2,500 ft.

A very large deciduous tree reaching 150 ft. in height and a considerable diameter, the base supported by large buttresses. Bark greyish-white, smooth; wood coarse and soft, largely used on the W. Coast for dug-out canoes. Vern. *Tam., Mal.* Chini.

Family LXXV. BEGONIACEAE.

Succulent herbs, sometimes undershrubs; stem often reduced to a rhizome or tuber. *Leaves* alternate, rarely subverticillate, more or less inequilateral, entire toothed or lobed; stipules 2, free, often deciduous. *Flowers* usually showy, white rose or yellow, monoecious, on axillary peduncles bracteate at base, divided above in dichotomous cymes; bracts and bracteoles opposite. MALE: Perianth of 2 outer valvate *sepals* with or without an inner smaller pair; *stamens* numerous, the filaments free or connate in a bundle; anthers usually narrowly obovoid, 2-celled, dehiscing longitudinally. FEMALE: Perianth of 2–6 sepals, the 2 outer usually large; *ovary* inferior, 2–4-celled, usually 3-celled and -winged; *placentas* axile, simple or 2 in each cell; ovules numerous; styles 2–4, free or connate; stigmas branched or twisted. *Fruit* a capsule, usually winged, variously but usually loculicidally dehiscent. *Seeds* minute; testa reticulate; albumen scanty or 0.

Begonia, Linn.

CHARACTERS OF THE FAMILY.

Placentas 2 in each cell; small plants with tuberous roots:—

Capsule 3-celled; sepals of ♂ flowers 4, the outer larger:—

Ovary pubescent, leaves ovate, cordate, acuminate; capsule-wings 3, elongate, one especially so, ascending; stigmas spiral 1. *picta.*

Ovary glabrous; leaves orbicular, cordate; capsule-wings 3, narrow, horizontal, sub-equal; stigmas branched, curved 2. *cordifolia.*

Capsule 2-celled; sepals of ♂ flowers 4, the outer larger:—

Stem succulent, rather stout; leaves up to 6 in. long, ovate, unequally often not deeply cordate, nearly entire, acute; capsule-wings 1 broad descending, 2 narrow; stigmas twisted 3. *integrifolia.*

Stems very slender, scarcely 6 in. long; leaves small, membranous:—

Capsule-wings subequal, triangular, ascending; stigmas reniform, papillose; outer sepals of ♂ orbicular, broad; leaves unequally cordate, up to 2 in. in diam. .... 4. *crenata.*

Capsule-wings narrow, one much longer and broader than the other 2, horizontal; stigmas 3–5-lobed, capitate; sepals of ♂ flowers obovate, narrow; leaves equally cordate, about 1 in. in diam............. ....5. *canarana.*

Placentas undivided:—

Stemless scapigerous herbs:—

Leaves peltate, reniform-orbicular, broader than long, entire, ciliate; scape longer than the leaves; sepals of ♂ flowers 4, outer slightly larger than inner; capsule-wings equal and equally broad (·2 in.), prominently reticulate .....6. *albo-coccinea.*

Leaves deeply cordate at base but not peltate:—

Leaves ovate, coarsely serrate, often lobed, acute, pilose, very membranous; scape slender, as long as the leaves; sepals of ♂ flowers 4, orbicular, inner narrow; capsule-wings subequal, broader above (about ·15 in.) and truncate.........7. *subpeltata.*

Leaves orbicular, broader than long, distinctly dentate, white-tomentose beneath, thick; scape elongate, many-flowered; sepals of ♂ flowers 2 only; capsule-wings subequal, broadest at the middle (·2 in.) .... 8. *floccifera.*

Stems elongate, leaf-bearing; leaves ovate, acute, serrate, sparsely pubescent, membranous; flowers large; sepals of ♂ flowers 4, outer much larger than the obovate inner, anthers long, capsule at first hispid, the wings subequal, ascending, broadest at top (·3–·4 in.) 9. *trichocarpa.*

Almost shrubby, the stems thick, jointed, leafy, the flowers on axillary peduncles; sepals in ♂ and ♀ 2 only, orbicular; leaves very unequally ovate-cordate, acuminate, serrate; capsule-wings subequal, rounded or slightly angled near the top where broadest, occasionally slightly acute at top .. .. 10. *malabarica.*

1. Begonia picta, Sm.; F. B. I. ii. 638.

N. Circars, hills of Ganjam (Gamble).

A slender plant of shady banks, the flowers pale rose, the leaves variegated.

2. Begonia cordifolia, Thw.; F. B. I. ii. 641. *Diploclinium Arnottianum* and *cordifolium*, Wt. Ic. tt. 1815, 1816.
   W. Gháts, in forests from Malabar to Tinnevelly.
   A scapigerous herb with pink flowers and variegated leaves.
3. Begonia integrifolia, Dalz.; F. B. I. ii. 648.
   W. Gháts, in the hills from Canara and Mysore to Wynaad.
   A short-stemmed succulent herb with white flowers.
4. Begonia crenata, Dryand.; F. B. I. ii. 651. *B. minima*, Bedd. Ic. t. 110.
   W. Gháts, from Mysore to Wynaad, at low levels.
   A slender herb with small pale pink flowers.
5. Begonia canarana, Miq.; F. B. I. ii. 652.
   W. Coast and W. Gháts, from S. Canara (Hohenacker) to Malabar and Wynaad, up to 3,000 ft.
   A very slender herb with small flowers.
6. Begonia albo-coccinea, Hook.; F. B. I. ii. 654. *B. Grahamiana*, Wt. Ic. t. 1811.
   W. Gháts, in the hills of Tinnevelly about Courtallum.
   A scapigerous succulent herb with rose-coloured flowers, rather large peltate leaves, and large membranous stipules at the base.
7. Begonia subpeltata, Wt. Ic. t. 1812; F. B. I. ii. 653.
   W. Gháts, probably in Malabar (Wight).
   A very slender herb with membranous leaves.
8. Begonia floccifera, Bedd. Ic. t. 111; F. B. I. ii. 654.
   W. Gháts, hills of Travancore and Tinnevelly, at 3000 ft. (Beddome).
   A rather large herb with woolly leaves and tall many-flowered scapes.
9. Begonia trichocarpa, Dalz.; F. B. I. ii. 653.
   W. Gháts, Bababudan Hills of Malabar (Law).
   A large fleshy herb with white flowers and large basal stipules.
10. Begonia malabarica, Lamk.; F. B. I. ii. 655. *B. dipetala*, Grah.; Wt. Ic. t. 1813. *Diploclinium Lindleyanum*, Wt. Ic. t. 1817.

W. Gháts, in the Nilgiri, Anamalai and Pulney Hills, up to 6,000 ft., in moist woods.

A large almost shrubby much-branching succulent plant with many rose-coloured flowers and large capsule, common and conspicuous. The shape of the capsule-wings is variable: sometimes they are pointed at apex, sometimes truncate, but more usually rounded.

B. anamalayana, Bedd., in Trans. Linn. Soc. xxv. 217 is a scapigerous herb with very oblique reniform leaves, the younger very floccose, the older glabrous. The scape is many-flowered, much longer than the leaves, and both ♂ and ♀ flowers have only 2 sepals. Anamalai Hills, in moist forests, at 3,000 ft.

Family LXXVI. CACTACEAE.

Herbs, shrubs or trees with usually succulent stems; branches often thickened, striated or angled. *Leaves* usually represented by tufts of spines or by prickles or small tubercles; stipules 0. *Flowers* regular, hermaphrodite, solitary. *Calyx*-tube adnate to the ovary; lobes 3–many, small, imbricate. *Petals* many, free or shortly united at base, imbricate. *Stamens* very many, free or adnate to the base of the petals; filaments filiform; anthers small. *Ovary* 1-celled; ovules very many, horizontal, on parietal placentas; style terminal, simple, filiform or cylindric; stigma 2–many-rayed. *Fruit* a 1-celled berry with pulpy placentas. *Seeds* very many, oblong or reniform; albumen copious scanty or 0; embryo straight or curved; cotyledons free or connate.

Opuntia, Mill.

Shrubs, with woody stems; branches jointed, the joints fleshy, flattened, ovate, tubercled, the tubercles hirsute and spiny. *Leaves* on youngest joints small, scale-like, deciduous; on older ones represented by spines. *Flowers* lateral, showy, yellow orange or red. *Calyx*-tube bearing small outer lobes adnate to the ovary, the inner lobes at its mouth. *Petals* many, spreading, connate below. *Stamens* very numerous, in many series. *Ovary* of many connate carpels; ovules many; style cylindric; stigmas many, thick, erect. *Fruit* a pear-shaped, fleshy, tubercled berry. *Seeds* compressed; testa very hard, albuminous cotyledons leaf-like.

Analysis, after I. H. Burkill in Records Bot. Survey India, IV.

Stamens exserted; flowers rose-coloured; spines 0.. 1. *coccinellifera.*
Stamens not exserted:—
Spines falling except one long one on each cushion; flowers yellow, the sepals and petals tinged with red.. ....2. *monacantha.*
Several large spines remaining on each cushion:—
Spines all straight, slender, tawny or purplish-black; flowers at opening lemon-yellow, changing to rose-pink..............3. *elatior.*
Spines some curved, the largest stout, light horn-coloured in life, darkening afterwards; flowers yellow...... ....4. *Dillenii.*

1. Opuntia coccinellifera, Mill.
Chingleput and Tinnevelly Districts in Carnatic.
A Mexican species which is only occasionally found in India and has apparently never spread itself widely; it was introduced at Masulipatam in 1788 with the object of acclimatizing the cochineal insect, for which it is suited.

2. Opuntia monacantha, Haw.
N. Circars, common; Carnatic, about Madras; Deccan, in Coimbatore.
A species which has spread widely in some localities and is at once recognized by its single straight thorns. It was introduced very early, certainly before 1786, probably from Brazil.

3. Opuntia elatior, Mill.
N. Circars, along the coast down to the Kistna river, also near Madras; Deccan, about Bellary.
A common species, but frequently mistaken for the next, it is recognized by its rose-pink flowers and was apparently introduced about 1800.

4. Opuntia Dillenii, Haw.; F. B. I. ii. 657; W. & A. 363 *excl. syn. Cactus indicus*, Roxb.; Wt. Ill. t. 114.
E. Coast from Ganjam to Madras, often quite close to the sea, inland also in various places; Deccan, in Bellary and Mysore, the most common species, easily recognized by its glaucous-green joints, yellow flowers, purple fruits and curved thorns. It comes probably from the Californian Peninsula and was introduced very early, and before 1786 it was established in Madras (Burkill). Many attempts have been made to eradicate it, but unsuccessfully in

general. Its spread is chiefly due to its use as a hedge plant. Vern. *Hind.* Nagphana.

Family LXXVII. AIZOACEAE.

Annual or perennial herbs. *Leaves* simple, often fleshy, opposite alternate or falsely whorled; stipules scarious or 0. *Flowers* regular, hermaphrodite or rarely polygamous, in cymes or fascicles, rarely solitary. *Calyx* of 4–5 sepals, free or rarely aduate to the ovary, usually persistent. *Petals* usually 0, when present small. *Stamens* perigynous or hypogynous, definite or indefinite, sometimes with staminodes; filaments free or connate in a cup; anthers oblong. *Ovary* free, 2–5-celled, syncarpous or rarely apocarpous; ovules many in each carpel, axile or solitary basal; styles as many as the carpels. *Fruit* usually capsular, dehiscing loculicidally or circumscissly, sometimes of indehiscent cocci. *Seeds* many or 1 in each carpel, usually reniform, compressed; testa membranous or crustaceous, often pitted or tuberculate; albumen mealy, surrounded by the curved or annular embryo.

Fruit syncarpous:—
  Calyx-tube elongate; stamens inserted on the calyx-tube; capsule circumsciss; petals 0:—
    Ovary and capsule 3–5-celled .... 1. **Sesuvium.**
    Ovary and capsule 1–2-celled .... 2. **Trianthema.**
  Calyx deeply 5-partite; stamens hypogynous; capsule 3–5-celled, loculicidal:—
    Petals many, small; seeds arillate .... 3. **Orygia.**
    Petals 0; seeds sometimes appendaged .... 4. **Mollugo.**
Fruit apocarpous; carpels 3–5, 1-seeded; petals 0............5. **Gisekia.**

1. Sesuvium, Linn.

Herbs or undershrubs, erect or prostrate, branched, succulent. *Leaves* opposite, entire, fleshy; stipules 0 or the petioles connected by a stipuliform membrane. *Flowers* axillary, sessile or peduncled, solitary or clustered; bracteoles 2 or 0. *Calyx*-tube turbinate; lobes 5, lanceolate, persistent, coloured within, apiculate below the tip, hyaline on the margins. *Petals* 0. *Stamens* 5 or many, inserted round the top of the calyx-tube; filaments usually connate at base. *Ovary* free, 3–5-celled; ovules numerous on axile placentas; styles 3–5. *Fruit* an ovate membranous 3–5-celled,

circumscissile capsule, the axis and placentas persistent. *Seeds* many, reniform; testa smooth; embryo annular.

SESUVIUM PORTULACASTRUM, Linn.; F. B. I. ii. 659.

E. and W. Coasts, on sea-shore sand.

A fleshy prostrate rooting stout-stemmed herb, the sepals purplish, the styles 3, the seeds black, shining, leaves linear-oblanceolate or spathulate.

Var. *repens*, Rottl. *S. repens*, Wt. in Hook. Comp. Bot. Mag. ii. 71; W. & A. 361. Leaves much smaller, obovate-spathulate, stems more slender.

2. Trianthema, Linn.

Diffuse prostrate branched herbs, glabrous or papillose. *Leaves* petioled, opposite, unequal, entire, subfleshy, the petioles of each pair connected at the base by stipuliform membranes. *Flowers* small, axillary, sessile or peduncled, solitary or in cymes or clusters; bracts membranous as are the 2 bracteoles. *Calyx*-tube short or long; lobes 5, coloured within, mucronate on the back near the tip. *Petals* 0. *Stamens* 5, 10 or 15, inserted near the top of the calyx-tube. *Ovary* free, sessile, usually truncate at apex, 1–2-celled; ovules 1 or more in each cell, from a basal placenta; styles 1 or 2, papillose. *Fruit* a capsule, circumsciss, the upper part carrying away 1–2 seeds, the lower 2–many-seeded. *Seeds* 1 or more, reniform, rough; embryo annular.

Style 1:—

Flowers solitary, sessile, sheathed by the base of the petiole; stamens 10 or 15; leaves obovate; capsule-top mitriform enclosing at least 1 seed, the lower part 3–5-seeded; seeds with concentric muriculate lines ....1. *Portulacastrum.*

Flowers fascicled, nearly sessile, not enclosed in the base of the petiole; stamens 5; leaves oblong or elliptic; capsule-top an annular depressed cushion enclosing 1 seed, the lower part also 1-seeded; seeds with concentric smooth lines ....2. *triquetra.*

Styles 2; flowers in clusters of dichasioid cymes; stamens 10 or 15; leaves elliptic or elliptic-oblong; capsule-top truncate with an annular rim enclosing 2 seeds, the lower part also 2-seeded; seeds with concentric muriculate lines ....3. *decandra.*

1. TRIANTHEMA PORTULACASTRUM, Linn. *T. monogyna*, Linn.; F. B. I. ii. 660. *T. obcordata*, Roxb.; W. & A. 355; Wt. Ic. t. 288.

Most plains Districts, a weed of roadside and waste lands.

2. TRIANTHEMA TRIQUETRA, Rottl. *T. crystallina,* W. & A. 355; F. B. I. ii. 660, *not of* Vahl.

Coast Districts of the Carnatic from Striharikota southwards, inland to Coimbatore.

Var. *oblongifolia,* Gamble. Leaves longer, up to ·75 in., and broader; calyx-lobes with more acuminate and longer mucros.

S. Carnatic, at Tuticorin (K. Rangachari).

3. TRIANTHEMA DECANDRA, Linn.; F B. I. ii. 661; W. & A. 355; Wt. Ic. t. 296.

Deccan and Carnatic, on dry-soil lands, common, a roadside weed.

3. Orygia, Forsk.

A diffuse branched glabrous herb. *Leaves* opposite and alternate, fleshy, entire, petioled; stipules 0. *Flowers* in terminal and leaf-opposed lax few-flowered cymes; bracts and bracteoles scarious. *Sepals* 5, ovate-cuspidate, the margins hyaline. *Petals* 0. *Stamens* numerous, inserted at the base of the calyx, subhypogynous; filaments filiform; staminodes many, connate at the base. *Ovary* globose, 5-celled; ovules many, axile, styles 5, filiform. *Fruit* a subglobose papery loculicidal capsule, surrounded by the persistent sepals; cells 5. *Seeds* many. reniform, compressed, strophiolate, with many concentric raised lines; embryo annular.

ORYGIA DECUMBENS, Forsk.; F. B. I. ii. 661. *Glinus trianthemoides,* Heyne; W. & A. 362; Wt. Ill. t. 113.

Deccan, in Hyderabad, Mysore and Coimbatore.

A branching herb with flowers in slender cymes, purple red staminodes (petals of Wight) and obovaté cuspidate fleshy leaves.

4. Mollugo, Linn.

Branching, often dichotomous, herbs. *Leaves* often falsely whorled, or alternate, or radical and rosulate, entire, linear obovate or spathulate; stipules membranous, caducous. *Flowers* axillary, greenish, solitary fascicled or in cymes or racemes; bracts minute. *Sepals* 5, persistent. *Petals* 0. *Stamens* 3–5, subhypogynous, alternate with the sepals, often with staminodes

intermixed. *Ovary* free, globose or ovoid, 3–5-celled; ovules many in each cell, axile; styles 3–5, linear or small clavate. *Fruit* a membranous, oblong globose or subcylindric, capsule, dehiscence loculicidal. *Seeds* several in each cell, rarely 1, reniform, sometimes appendaged at the hilum; embryo annular.

Flowers in axillary fascicles; seeds appendaged and with a slender white thread curved round them :—

Leaves densely stellate-hairy, orbicular to obovate and spathulate; pedicels usually very short; sepals densely stellate hairy 1. *lotoides.*

Leaves glabrous or slightly crispate-pubescent, usually oblanceolate but sometimes almost orbicular; pedicels long, filiform; sepals glabrous...2. *oppositifolia.*

Flowers in terminal cymes; seeds not or minutely appendaged, no curved thread :—

Leaves in whorls at the nodes :—

Cymes corymbosely branched; pedicels long, filiform :—

Leaves linear-lanceolate to obovate; stems quadrangular; seeds dark reddish-brown, shining, tuberculate...3. *pentaphylla.*

Leaves linear, very narrow; stems very slender, terete; seeds golden-brown, reticulate, not tuberculate.. ....4. *Cerviana.*

Cyme-branches lengthening into elongated racemes; pedicels short; leaves linear-lanceolate; stems angular; seeds golden-brown with flattened papillae, not tuberculate, the back furrowed 5. *disticha.*

Leaves all radical, spathulate; flower-peduncles many, erect, trichotomously branched; pedicels filiform; seeds reddish-black, covered with minute flattened tubercles................. 6. *nudicaulis.*

1. Mollugo lotoides, O. Kze. *M. hirta*, Thunb.; F. B. I. ii. 662. *Glinus lotoides,* Loefl.; W. & A. 362. *G. dictamnoides*, Linn.; W. & A. 362.

Deccan and Carnatic, in dry sandy places, and on waste lands, common.

A prostrate herb covered with stellate hairs, the leaves usually orbicular, the pedicels sometimes up to ·75 in. long, but more usually very short.

2. Mollugo oppositifolia, Linn. *M. Spergula*, Linn.; F. B. I. ii. 662; W. & A. 44.

Deccan and Carnatic, in dry places and on waste lands and fallow fields, common.

A slender prostrate herb, the leaves eaten and used medicinally. Vern. *Tam.* Toora.

3. Mollugo pentaphylla, Linn. *M. stricta*, Linn.; F. B. I. ii. 663; W. & A. 44.

All plains Districts and at low elevations in the hills, a common weed.

An erect slender glabrous herb, the leaves very variable in shape.

4. Mollugo Cerviana, Ser.; F. B. I. ii. 663; W. & A. 44.

Deccan and Carnatic, in sandy places, especially near the coast.

A very slender small glabrous herb, many branched from the base.

5. Mollugo disticha, Ser.; F. B. I. ii. 663; W. & A. 44; Wt. Ic. t. 3.

East Coast, in sandy places not far from the sea.

An erect rather stout long-leaved herb, more or less crispate-pubescent.

6. Mollugo nudicaulis, Lam.; F. B. I. ii. 664; W. & A. 43.

Deccan and Carnatic, in dry places.

An erect annual herb with rosulate leaves.

5. Gisekia, Linn.

Diffuse branched herbs. *Leaves* opposite or falsely whorled, fleshy, spathulate, abounding in raphides; stipules 0. *Flowers* small, hermaphrodite or polygamous, in axillary fascicles of short cymes. *Sepals* 5, ovate, herbaceous with membranous margins, many white raphides. *Petals* 0. *Stamens* 5–15, hypogynous; filaments dilated at the base, anthers oblong. *Carpels* usually 5, distinct, sessile on a small torus, 1-celled, ovule 1 in each cell, basal; styles simple. *Fruit* of 5 free, membranous, white-papillose, indehiscent, 1-seeded carpels. *Seeds* vertical, compressed, subreniform; embryo annular.

Gisekia pharnaceoides, Linn.; F. B. I. ii. 664; Roxb. Cor. Pl. t. 183; Wt. Ic. t. 1167.

Deccan and Carnatic, from the Godavari southwards, on waste lands.

A diffuse usually prostrate herb with fleshy glaucous leaves and black minutely pitted seeds. Vern. *Tel.* Ishi-rash kura.

Family LXXVIII. UMBELLIFERAE.

Herbs, rarely shrubs or trees. *Leaves* usually alternate, simple or compound, the petiole generally sheathing at base; stipules 0 or rarely small and scarious. *Flowers* regular or irregular, hermaphrodite or polygamous, in compound, rarely simple, umbels, the outer flowers of the umbel sometimes radiant; umbels and umbellules each furnished with involucral bracts or bracteoles, which may sometimes be absent from one or both. *Calyx*-tube adnate to the ovary, limb 5-toothed or 0. *Disk* epigynous, 2-lobed. *Petals* 5, epigynous, sometimes unequal, often bifid, with an inflexed apex and a median fold. *Stamens* 5, epigynous, alternating with the petals. *Ovary* inferior, 2-celled, crowned by the disk; ovule solitary in each cell, pendulous; styles 2, often dilated at the base into stylopods; stigmas capitate. *Fruit* of 2 indehiscent dorsally or laterally compressed mericarps separated by a commissure and attached to and often pendulous from a slender forked carpophore; the mericarps usually marked by 5 longitudinal primary ridges, often alternating with secondary ones, the pericarp traversed by oil-canals (vittae). *Seed* 1 in each mericarp, pendulous; albumen cartilaginous; embryo minute, near the apex, the radicle superior.

Umbels simple; leaves orbicular, undivided; fruit laterally compressed; vittae 0:—
- Mericarps with 3 ridges, the commisural obscure; flowers white; pericarp of seed thin .... 1. **Hydrocotyle.**
- Mericarps with 7–9 ridges, the primary and secondary similar netveined between, flowers red; pericarp thick .... 2. **Centella.**

Umbels in groups of about 3, sessile in the axils of a cymose panicle; leaves 3–5-partite; fruit covered with hooked prickles; vittae many 3. **Sanicula.**

Umbels compound:—
- Fruit laterally compressed:—
  - Leaves entire; flowers yellow or lurid; mericarp with 5 primary ridges, the secondary inconspicuous .... 4. **Bupleurum.**
  - Leaves usually pinnate or decompound; flowers white:—
    - Involucral bracts and bracteoles absent; umbels leaf-opposed **Apium.**
    - Involucral bracts and bracteoles usually present:—
      - Furrows between the ridges usually with 1 vitta...5. **Carum.**
      - Furrows between the ridges 2–3-vittate.........6. **Pimpinella**

Fruit widest at the commissure, circular or somewhat dorsally compressed in section; primary ridges distinct:—
  Fruit globose, the ridges prominent; petals white ...... 7. **Seseli.**
  Fruit ovoid:—
    Flowers yellow; leaves large with filiform segments **Foeniculum.**
    Flowers white; leaves small; vittae many:—
      Bracts prominent .... 8. **Schultzia.**
      Bracts none or small .... 9. **Polyzygus.**
Fruit dorsally compressed, the mericarps flattened, the lateral ridges winged:—
  Wings of the mericarps with thick margins; vittae on the faces of the mericarps usually extending to the base; petals not radiant .... 10. **Peucedanum.**
  Wings of the mericarps with thin margins; vittae usually not extending to the base; petals very often radiant 11. **Heracleum.**
Fruit subterete, not winged; secondary ridges of the mericarps prominent; petals radiant:—
  Fruits glabrous; involucral bracts none .... **Coriandrum.**
  Fruits setose; involucral bracts prominent, pinnate ..... **Daucus.**

1. Hydrocotyle, Linn.

Prostrate herbs, rooting at the nodes, growing in moist places. *Leaves* orbicular or reniform, palmately lobed, long-petioled; stipules scarious. *Flowers* white, small, in simple small axillary sessile or pedicellate umbels; involucral bracts small or 0. *Calyx*-teeth none or very small. *Petals* entire, acute, valvate. *Fruit* laterally compressed, small; mericarps with 3 primary but without secondary ridges; vittae 0.

Leaves 1–3·5 in. in diam., 7–9-lobed; umbel-peduncles clustered, up to 2 in. long; mericarps very little compressed, the primary ridges obscure .... 1. *javanica.*
Leaves 1–2 in. in diam., 7–9-lobed; umbels solitary, sessile or very shortly peduncled; mericarps slightly compressed, the primary ridges apparent .... 2. *conferta.*
Leaves ·1–·5 in. in diam., 7–lobed; umbel peduncles solitary, very slender, up to ·75 in. long; mericarps compressed, the primary ridges angular .... 3. *rotundifolia.*

1. HYDROCOTYLE JAVANICA, Thunb.; F. B. I. ii. 667. *H. polycephala*, W. & A. 366; Wt. Ic. t. 1003.
   W. Gháts, in the Nilgiris and Pulneys, in shady places at high levels.
2. HYDROCOTYLE CONFERTA, Wt. Ic. t. 1002; F. B. I. ii. 668.
   W. Gháts, in the Nilgiris and Pulneys, at high levels in wet places.
3. HYDROCOTYLE ROTUNDIFOLIA, Roxb.; F. B. I. ii. 668; Wt Ic. t. 564. *H. tenella*, D. Don; W. & A. 366.
   E. Gháts, hills of Vizagapatam, at 5,000 ft.; W. Gháts, in the Nilgiris and Pulneys, in bogs and on bare wet soil, up to 7,000 ft.

2. Centella, Linn.

Prostrate herbs, rooting at the nodes. *Leaves* orbicular, crenate, palmately nerved, deeply cordate with an angular sinus, long-petioled; stipules scarious. *Flowers* reddish, small, sessile, in simple axillary few-flowered umbels; involucral bracts 2, small. *Calyx* truncate. *Petals* minute, ovate, acute, imbricate. *Fruit* laterally compressed, the mericarps with about 7–9 subsimilar ridges, the secondary ridges as prominent as the primary, reticulate between them, vittae 0; pericarp thickened.

CENTELLA ASIATICA, Urban. *Hydrocotyle asiatica*, Linn.; F. B. I. ii. 669; W. & A. 366; Wt. Ic. t. 565.
   All plains Districts in wet places, the borders of ricefields, and on banks, up to 6,000 ft. in the hills.
   A common trailing and rooting weed with leaves up to 2 in. in diam., orbicular-cordate with rather shallow sinus.

3. Sanicula, Linn.

Erect herbs. *Leaves* deeply 3–5-partite, the segments again lobed and mucronate-serrate, chiefly radical and long-petioled. *Flowers* very small, mostly unisexual, in groups of about 3 umbels, sessile in the forks and on the branches of a cymose panicle, the bracts sessile, leaf-like; umbellules usually small, few-flowered, with few bracteoles. *Calyx*-lobes herbaceous, lanceolate. *Petals* white, with long incurved points. *Disk* flattened, thickened round the filiform styles. *Fruit* ovoid, not compressed, the mericarps

thickly covered with hooked spiny prickles, without ridges, vittae many.

Sanicula europaea, Linn.; F. B. I. ii. 670. *S. elata*, Ham.; W. & A. 367; Wt. Ill. t. 117, fig. 2; Wt. Ic. tt. 334, 1004.

W. Gháts, in the Nilgiris and Pulneys above 6,000 ft., in Sholas and similar shady places.

A perennial herb of wide distribution but variable, the S. Indian form having the leaves acuminately lobed.

4. **Bupleurum**, Linn.

Glabrous herbs or shrubs. *Leaves* entire. *Flowers* small, yellow or lurid, in compound umbels; involucral bracts and bracteoles usually present. *Calyx*-lobes 0. *Petals* 5, obovate, inflexed, the apex emarginate. *Disk* broad, flat. *Styles* short. *Fruit* laterally compressed, slightly constricted at the commissure; mericarps subpentagonal, primary ridges distinct, sometimes almost winged, secondary 0 or obscure; vittae 1–3 in the furrows between the primary ridges; carpophore 2-fid or 2-partite. *Seed* terete, sometimes slightly grooved on the inner face.

Erect, usually single-stemmed shrub up to 6 ft. high; lower leaves up to 6 in. long, cauline shorter, obtuse, all mucronate; bracts and bracteoles broad; mericarps ·3–·4 in. long with 5 corky ridges shortly winged; vittae 1 in each furrow between them ...1. *plantaginifolium*.

Erect perennial herbs up to 3 ft. high or even more; bracts and bracteoles narrow, 3-nerved; mericarps semi-ellipsoid, 5-ridged:—

Leaves linear-oblong, obtuse at apex and mucronate, usually 1–3 in. long, ·3 in. broad; mericarps with 1–3 vittae in the furrows 2. *mucronatum*.

Leaves linear, acute at apex and mucronate, up to 4 in. long, ·25 in. broad; mericarps with usually 3 vittae in the furrows...3. *virgatum*.

Erect slender perennial herb up to 1 ft. high; lower leaves crowded near the base, upper few, all linear mucronate; bracts and bracteoles lanceolate, hair-pointed; mericarps semi-ovoid, ·1 in. long with distinct ridges; vittae 1 in each furrow, sometimes 3 at commissure 4. *distichophyllum*.

1. Bupleurum plantaginifolium, Wt. Ic. t. 281; F. B. I. ii. 674.

W. Gháts, in the Shola Forests of the Nilgiris, above 6,000 ft.

A shrub, often with a single stem up to 6 ft. high, the stem marked by the round scars of fallen leaves. Basal leaves long and narrow with very oblique subparallel nerves; cauline leaves shorter and broader and very obtuse.

2. BUPLEURUM MUCRONATUM, W. & A. 370; F. B. I. ii. 676, *in part.*

W. Gháts, in the Nilgiris at about 7,000 ft., among bushes, scarce in Pulneys.

A bushy plant with knotted stems and many leaves, the cauline similar to the radical.

Var. *ramosissimum*, C. B. Clarke in F. B. I. ii. 676. *B. ramosissimum*, W. & A. 370; Wt. Ic. t. 1007.

W. Gháts, in the Nilgiris and Pulneys, at 6,000–8,000 ft.; Shevaroy Hills of Salem.

A low bushy plant with more terete stems and shorter leaves, less obtuse at apex or sometimes acute.

3. BUPLEURUM VIRGATUM, W. & A. 370. *B. mucronatum* var. *virgatum*, C. B. Clarke in F. B. I. ii. 676.

W. Gháts, in the Pulney Hills, at about 7,000 ft., among grass on the downs.

A tall erect herb with terete stems and narrow, long and sharply mucronate-acuminate leaves; the umbels long-peduncled with many rays.

4. BUPLEURUM DISTICHOPHYLLUM, W. & A. 370; F. B. I. 677; Wt. Ic. t. 1006.

W. Ghats, in the Nilgiri Hills, above 7,500 ft., on the open downs.

A slender erect herb, the radial leaves tufted.

A small specimen from the Madgol Hills of Vizagapatam, 4,000 ft. (A. W. Lushington), seems to belong to *B. falcatum*, Linn.

5. **Carum**, Linn.

Annual or perennial herbs. *Leaves* pinnate or decompound. *Flowers* white, polygamous, the sterile flowers often with irregular petals; umbels compound; involucral bracts few or 0; bracteoles numerous, entire. *Calyx*-teeth small or 0. *Petals* broad, obtuse retuse or emarginate. *Fruit* ovoid ellipsoid or oblong, laterally compressed and more or less constricted at the commissure;

mericarps subpentagonal, the inner face flattened; primary ridges usually conspicuous, vittae in the furrows single; carpophore bifid. *Seed* terete, flat or obscurely channelled on the inner face.

CARUM NOTHUM, C. B. Clarke in F. B. I. ii. 681.

Mysore (Lobb); W. Ghâts, on rocks above Sispara in W. Nilgiris, at 7,500 ft. (Gamble).

A bulbous-rooted herb reaching about 1 ft. in height, with small leaves with linear segments, the mericarps strongly ridged, the umbels of about 7 rays with linear-lanceolate bracts.

Carum Petroselinum, Benth. and Hook. f., is the Parsley occasionally cultivated, chiefly in the gardens of European residents.

6. **Pimpinella,** Linn.

Herbs, annual biennial or perennial. *Leaves* simple or compound. *Flowers* in compound umbels, hermaphrodite or polygamo-monoecious; involucral bracts few or 0, bracteoles usually linear small, or 0. *Calyx*-teeth small, lanceolate. *Petals* with long inflexed points, entire or emarginate. *Styles* usually long, sometimes very short. *Fruit* laterally compressed, usually constricted at the commissure, ovoid; mericarps subpentagonal, the inner face flattened; ridges slender, vittae 2–3 in the furrows between them. *Seed* terete or dorsally compressed, inner face usually flat.

Fruit glabrous or nearly so:—

- Fruit short, ovoid or subglobose, didymous, disk obsolete; styles very short; leaves trifoliolate, membranous, subglabrous, the leaflets again sometimes divided, narrowed at base, deeply serrate; bracts 0, bracteoles 1–2 or 0 .... 1. *Heyneana*.
- Fruit ovoid with conspicuous conical disk and long styles:—
  - Basal leaves orbicular- or broadly ovate-cordate, with narrow sinus or overlapping, serrate, pubescent, about 3–5-nerved, petioles up to 2 in. long, cauline leaves pinnatifid soon reduced to mere petiole-sheaths; bracts and bracteoles 0 ... 2. *Leschenaultii*.
  - Basal leaves orbicular-cordate, with broad (5-in.) sinus, serrate, hispid pubescent on nerves above otherwise glabrous, about 10–20-nerved, petioles up to 12 in. long, cauline leaves pinnatifid, gradually reduced to linear petiole-sheaths; bracts 0, bracteoles few, linear, persistent .... 3. *pulneyensis*.

Fruit papillose—scabrous, ovoid:—

Fruit densely papillose, disk conical; styles long and slender; basal leaves orbicular-cordate, sometimes 3-partite, serrate, pubescent, passing in cauline ones to deeply pinnatifid, and finally to a sheath with pinnatifid blade; bracts and bracteoles many, small, linear.......................................4. *Candolleana.*

Fruit sparsely papillose, didymous, disk small; styles short; basal leaves, if present, ovate-cordate, acute, serrate, glabrous, lower cauline leaves trifoliolate, large, upper also trifoliolate, with slender acuminate serrate leaflets; bracts 0, bracteoles 0 or 1–3, small.......................................5. *monoica.*

1. PIMPINELLA HEYNEANA, Wall.; F. B. I. ii. 684. *Heliosciadium ? Heyneanum*, DC.; W. & A. 368.

   Circars and Deccan, in hill forests, scarce; W. Gháts, from the Coimbatore Hills to Tinnevelly.

   An erect annual herb, the flower umbels with many long slender rays.

2. PIMPINELLA LESCHENAULTII, DC.; F. B. I. ii. 687; W. & A. 369; Wt. Ic. t. 1005.

   W. Gháts, in the Nilgiris, above 6,000 ft.; on the open downs near sholas with long-petioled basal leaves (Fyson).

   An erect almost scapigerous perennial with white flowers.

3. PIMPINELLA PULNEYENSIS, Gamble in Kew Bull. 1919, 228.

   W. Gháts, at Bear Shola and in other moist woods in the Pulney Hills, about 6,000–7,000 ft. (Bourne).

   A tall herb reaching 1–2 ft. high, with long-petioled basal and lower cauline reniform leaves with many palmate nerves, the upper cauline leaves tripartite and lobed; flowers white.

4. PIMPINELLA CANDOLLEANA, W. & A. 369; F. B. I. ii. 687; Wt. Ic. t. 341.

   W. Gháts, in the Nilgiris and Pulneys, above 6,000 ft., in grass lands near Shola forests, more scarce to the hills of S. Tinnevelly.

   An erect tawny pubescent tall perennial with orbicular cordate basal leaves and characteristic papillose fruits, the flowers white.

5. PIMPINELLA MONOICA, Dalz.; F. B. I. ii. 687.

   N. Circars, in the hills from Ganjam to Godavari, at low

levels, up to 3,000 ft.; W. Gháts, Mudumalai in Wynaad at 2,000 ft., Anamalais; Shevaroy Hills of Salem.

A tall erect monoecious herb with white flowers and umbels with very slender rays.

7. **Seseli,** Linn.

Herbs. *Leaves* 2–3-pinnate or twice 3-partite. *Flowers* white, in compound umbels; involucral bracts 0 or few, rarely many, bracteoles many. *Calyx*-teeth minute, lanceolate or linear, or 0. *Petals* 5, with a long inflexed acumination. *Styles* short. *Fruit* oblong ovate or globose, broadest at the commissure, not compressed; mericarps semi-terete or compressed dorsally, the inner face flat or sometimes concave; ridges strong, obtuse or subacute, lateral hardly larger than the dorsal; vittae in each furrow solitary, large, others smaller often under the ridges; disk not prominent. *Seed* semi-terete, the inner face somewhat concave.

Seseli indicum, W. & A. 371; F. B. I. ii. 693. *Cnidium diffusum*, DC.; Wt. Ic. t. 569.

Plains Districts of the Carnatic (Heyne).

An annual herb. usually diffuse, with many branches, white or pinkish flowers and a globose fruit with prominent ridges and straight hairs stellate at the apex.

8. **Schultzia,** Spreng.

Glabrous perennial herbs. *Leaves* 1–2-pinnate, ultimate pinnae toothed, pinnatifid or multifid. *Flowers* in compound umbels; involucral bracts several, entire or divided, bracteoles numerous. *Calyx*-teeth prominent. *Petals* obovate, emarginate, white. *Fruit* ovate-oblong, the commissure broad; mericarps dorsally compressed, primary ridges slender, furrows between them with 2–4 vittae; carpophore bipartite.

Schultzia ? Benthami, C. B. Clarke in F. B. I ii. 697.

W. Coast, in Canara (Hohenacker).

A tall herb with short pinnate leaves and rather large mericarps with 3 prominent ridges on the back followed by two secondary, in section crescent-shaped, the commissure with 4 vittae, vittae in the furrows between the ridges in pairs.

9. Polyzygus, Dalz.

A glabrous herb with tuberous root. *Leaves* ternately and pinnately decompound, the segments pinnatifid. *Flowers* small, white, in compound umbels; involucral bracts very few or 0; bracteoles few, small, setaceous. *Calyx*-teeth small or the outer slightly larger. *Petals* obovate with an inflexed acumination. *Styles* slender. *Fruit* small, ovoid, terete, broad at the commissure; mericarps semiterete, the primary ridges obscure, furrows between them broad, 1–3-vittate; carpophore bipartite. *Seed* semiterete, flat on the inner face.

POLYZYGUS TUBEROSUS, Dalz.; F. B. I. ii. 698.

W. Gháts, Canara and Mysore (Law).

A weak herb with membranous leaves and tuberous root, very little known.

10. Peucedanum, Linn.

Perennial herbs. *Leaves* pinnately or ternately decompound, the ultimate segments lanceolate or ovate, rarely linear, entire or toothed. *Flowers* white yellow or rarely pink, often polygamous, in compound umbels usually with many rays; bracts of various shapes; bracteoles many, few or 0. *Calyx* with entire or subentire limb; teeth small. *Petals* obovate or cuneate, inflexed at the tip, entire or emarginate. *Disk* undulate, the stylopods usually small. *Ovary* glabrous. *Fruit* much dorsally compressed, elliptic oblong or orbicular; mericarps slightly convex on the back, their margins more or less acutely winged; the dorsal ridges little elevated; vittae usually solitary in the dorsal furrows, 2–6 on the commissure. *Seed* flat, the inner face flat.

Leaflets oblong or oblanceolate, entire; mericarps elliptic, ·3 in. long, ·2 in. broad, with thick dark margins; dorsal furrows 1-vittate, lateral 2-vittate, commissure 2-vittate, vittae not conspicuous. 1. *Dhana.*

Leaflets linear-lanceolate, distantly serrate; mericarps orbicular, ·2 in. in diam., the margins pale and rather thin; dorsal furrows 1-vittate, lateral 1–2-vittate, commissure 4–6-vittate, the vittae conspicuous but often short.. .... 2. *anamallayense.*

1. PEUCEDANUM DHANA, Ham.; F. B. I. ii. 709, *var. Dalzellii*, C. B. Clarke.

E. Gháts, in Ganjam (Barber) and the Madgol Hills of Vizagapatam, at 3,000 ft. (A. W. Lushington).

A glabrous herb reaching 2 ft. in height, the flowers yellow.

2. PEUCEDANUM ANAMALLAYENSE, C. B. Clarke in F. B. I. ii. 710.

W. Ghâts, in the Anamalai forests (Wight, Beddome).

A tall herb with fistular fluted stems and much cut leaves with narrow leaflets.

Peucedanum sativum, Benth. and Hook. f., the Parsnip, is occasionally cultivated in gardens.

11. Heracleum, Linn.

Perennial or biennial more or less hairy herbs, often of large size. *Leaves* 1–2–3-pinnate, the segments usually broad, lobed and toothed. *Flowers* white or yellow, often polygamous, in compound umbels, large and with many rays; involucral bracts few, simple or 0, rarely many, foliaceous; bracteoles many. *Calyx*-lobes 0 or small and linear-lanceolate. *Petals* usually unequal, often radiant, the larger often widely spreading, bifid or emarginate, all with an incurved apex. *Ovary* usually pubescent. *Fruit* orbicular, elliptic or obovate, much dorsally compressed, winged, the wing with usually thickened margins; ridges slender; vittae usually solitary in the dorsal furrows, 2–4 or rarely more on the commissure, all descending from the short thick stylopod to below the middle of the fruit and sometimes dilated at the ends. *Seed* much dorsally compressed, plano-convex.

Lower leaves simple, usually 3-lobed, rarely pinnatifid, densely villous; outer flowers of the umbellule usually radiant; mericarps elliptic, broadly winged, vittae usually 4 on the back, 2 on the commissure..1. *Hookerianum.*

Lower leaves pinnate:—

Pinnae usually 1 to 2 pairs with a terminal usually 3-lobed, large, glabrous; petals equal; mericarps orbicular, broadly winged, vittae usually 6 on the back, 4–6 on the commissure......2. *aquilegifolium.*

Pinnae 1–3 pairs, small and distant, with a terminal broad 3-lobed, hoary-pubescent; petals equal; mericarps elliptic-obovate, thick on the back, vittae usually 4 on the back, 4 and often more on the commissure..3. *rigens.*

Pinnae 2–3 pairs, both the side and end ones long and deeply pinnatifid, tawny-pubescent; petals very unequal, the radiant ones very conspicuous; mericarps elliptic or very slightly obovate, ·3 to

·4 in. long by ·2–·3 in. broad, the wings narrow, vittae on the back 4, on the commissure usually 2 ....4. *ceylanicum.*

Lower leaves bipinnate, sometimes nearly tripinnate:—

Fruit small, elliptic, ·25 by ·2 in., wing narrow, vittae 4 on the back, extending down three-fourths of the face, 2–4 and unequal on the commissure; bracteoles lanceolate, ·15 in. long; lower leaves 1–2-pinnate, the pinnules broad, pinnatifid, shortly crenate-serrate, mucronate, covered above with scattered scales, hispid on nerves beneath..5. *Sprengelianum.*

Fruit large, at least ·3 in. long:—

Fruit obovate, ·45 by ·2 in., wing rather broad, vittae 4 on the back, extending down two-thirds of the face, 2 on commissure; bracteoles lanceolate, long acuminate, ·25 in. long; lower leaves much cut, bipinnate, the pinnules deeply lobed, sharply serrate, covered above and on nerves beneath with long soft hairs
6. *courtallense.*

Fruit elliptic, ·3–·4 by ·25–·3 in., wing narrow, vittae 4–6 on the back, extending nearly to the base, 2–4 on commissure; bracteoles lanceolate, ·25 in. long; lower leaves 1- to almost 3-pinnate, the pinnules broad, not deeply lobed, shortly serrate, both surfaces with short soft hairs ... .7. *Candolleanum.*

Leaves pedately 5–7-foliolate, with lanceolate leaflets cuneate at base and sharply serrate above; petals unequal; mericarps apparently unequally winged...8. *pedatum.*

1. Heracleum Hookerianum, W. & A. 373; F. B. I. ii. 715. *Pastinaca Hookeriana*, Wt. Ic. t. 1010.
W. Gháts, open downs on the Nilgiris above 7,000 ft.
An erect herb with white flowers sometimes tinged with red, leaves villous and sticky, nearly all radical and flat on the ground, the stem 1 to 1·5 rarely to 2 ft. high.

2. Heracleum aquilegifolium, C. B. Clarke in F. B. I. ii. 715.
W. Gháts, in the Anamalai Forests (Wight).
An erect herb reaching 2–3 ft. in height.

3. Heracleum rigens, Wall.; F. B. I. ii. 715; W. & A. 373. *Pastinaca rigens*, Wt. Ic. t. 1009.
W. Gháts, in the Nilgiri and Pulney Hills, on open downs above 6,000 ft.
A tall, erect, greyish-pubescent herb reaching 3 ft. in height, with yellow flowers, the leaves both radical and cauline, remarkable for the distant, more or less orbicular-cordate, slightly lobed leaflets.

Var. *multiradiatum*, Gamble.

W. Gháts, in the Pulney Hills, at lower levels.

A larger plant with larger and more cut leaflets and very large umbels, often with 30 or more rays 4–5 in. long, commissural vittae sometimes up to 10.

Var. *elongatum*, Gamble.

W. Gháts, in the Pulney Hills (Bourne).

A slenderer plant with thinner leaves, large umbels and an elongated fruit almost oblanceolate, ·6 in. by ·25 in., vittae on the commissure 2–4.

4. HERACLEUM CEYLANICUM, Gardn.; F. B. I. ii. 716; Fyson Hill. Fl. 175.

W. Gháts, in the Pulney Hills, on the downs at high levels (Bourne).

A tall handsome species with much cut fern-like leaves, conspicuous white radiant flowers and very large umbels with sometimes over 40 rays, some nearly 6 in. long.

5. HERACLEUM SPRENGELIANUM, W. & A. 372; F. B. I. ii. 716. *Pastinaca Sprengeliana*, Wt. Ic. t. 1008.

W. Ghats, in the Nilgiri Hills, above 6,000 ft., in grassy places near the Sholas (Wight, Gardner), apparently scarce.

A large very leafy plant at once recognized by the small fruit.

6. HERACLEUM COURTALLENSE, Gamble n. comb. *H. rigens*, Wall. var. *Candolleana*, C. B. Clarke in F. B. I. ii. 715 *in part*. *Pastinaca ligusticifolia*, W. & A. 372; Wt. Ill. t. 116.

W. Gháts, at Courtallum in Tinnevelly (Wight).

A tall leafy plant, with much cut deeply serrate leaves and long fruit.

7. HERACLEUM CANDOLLEANUM, Gamble n. comb. *H. rigens*, Wall. var. *Candolleana*, C. B. Clarke in F. B. I. ii. 715 *in part*. *Pastinaca Candolleana*, W. & A. 372.

W. Gháts, from the Nilgiris to the Anamalai and Pulney Hills, above 6,000 ft. common.

A large leafy plant with broad leaves, shortly serrate.

8. HERACLEUM PEDATUM, Wt. Ic. t. 342; F. B. I. ii. 716.

W. Gháts, in the Pulney and Sivagiri Hills in the undergrowth of Shola forest.

A trailing and rooting herb of ground vegetation, with small white radiant flowers and pedate leaves.

Apium graveolens, Linn., Celery, and *Daucus Carota*, Linn., Carrot, are occasionally cultivated in gardens as vegetables.

Foeniculum vulgare, Gaertn., Fennel, *Anethum Sowa*, Roxb., Dill, and *Coriandrum sativum*, Linn., Coriander, are sometimes cultivated for their leaves and seeds and may occasionally be found run wild.

Family LXXIX. ARALIACEAE.

Trees or shrubs, sometimes climbing, rarely herbs, glabrous or stellately pubescent, frequently prickly. *Leaves* alternate, rarely opposite, long-petioled, large, simple or compound; stipules adnate to the petiole, sometimes within its sheathing base, rarely 0. *Flowers* regular, hermaphrodite or polygamous, in umbels racemes or panicled heads, with bracts and bracteoles; pedicels continuous with the base of the calyx or there articulated. *Calyx*-tube adnate to the ovary; limb truncate or with small teeth. *Petals* usually 5, rarely more, valvate or slightly imbricate, separating or deciduously calyptrate. *Stamens* as many as and alternate with the petals, inserted round an epigynous disk. *Ovary* inferior, 1- to many-celled; ovules solitary in each cell, pendulous; styles as many as the cells, distinct or united. *Fruit* usually drupaceous or dry, cells as many as the ovary. *Seed* pendulous; testa thin; albumen uniform or ruminate; embryo minute, radicle superior.

Petals imbricate in bud :—
  Styles 3–5, free ; leaves compound, often prickly..............1. **Aralia.**
  Styles 5, combined ; leaves pinnate......................2. **Pentapanax.**
Petals valvate in bud : —
  Ovary 2-celled ; leaves compound.......................... **Nothopanax.**
  Ovary 4–10-celled :—
    Pedicels jointed ; leaves pinnate.......................3. **Polyscias.**
    Pedicels continuous ; leaves digitate...................4. **Schefflera.**

1. Aralia, Linn.

Herbs, shrubs or small trees, often prickly. *Leaves* alternate or whorled, digitate pinnate or compound-pinnate; leaflets serrate or nearly entire; stipules small, not prominent. *Flowers* often

polygamo-monoecious, in solitary racemed or panicled rarely compound umbels; pedicels often jointed close under the flower. *Calyx* truncate or 5-lobed. *Petals* 5, ovate, imbricate in bud. *Stamens* 5. *Ovary* 2–5-celled; styles 2–5, free or shortly connate at the base. *Fruit* a small 4–5-celled and -angled or 2–3-celled and subglobose berry. *Seeds* compressed; albumen uniform.

ARALIA MALABARICA, Bedd. Fl. cxxi.; F. B. I. ii. 722.

W. Gháts, Wynaad to Travancore at 2,000–3,000 ft., in evergreen forests.

A large shrub or small tree with scattered prickles on the stems and leaves. Leaves bipinnate, leaflets lanceolate, sharply serrate; flowers in a spreading panicle of prominently bracteate umbels.

A leaf specimen from the Madgol Hills of Vizagapatam (A. W. Lushington) appears to belong to *A. foliolosa*, Seem.; F. B. I. ii. 723, var. *sikkimensis*, C. B. Clarke. It is a small, single-stemmed, erect treelet with very prickly leaves and stems.

2. **Pentapanax,** Seem.

Trees or large climbing shrubs, often epiphytic. *Leaves* alternate, simply pinnate with 3–5 or more leaflets or digitate with 3–5 leaflets, glabrous. *Flowers* hermaphrodite or polygamous, in compound racemes or panicles of umbels; pedicels jointed under the flowers. *Calyx* 5-lobed. *Petals* 5, imbricate in bud. *Stamens* 5. *Ovary* 4–5-celled; styles 4–5, combined at any rate except the tips. *Fruit* 4- or 5-celled and -angled or -ribbed.

PENTAPANAX LESCHENAULTII, Seem.; F. B. I. ii. 724. *Hedera Leschenaultii*, W. & A. 377. *H. trifoliata*, W. & A. 377; Wt. Ic. t. 307.

W. Gháts, in the Nilgiris and southwards at high elevations as on Dodabetta at 8,000 ft.

A tree with 3–5 ovate-acuminate bristly-serrated leaflets, and panicles of globose umbels, the fruit not deeply angled. It is sometimes found growing epiphytically on other trees.

3. **Polyscias,** Forst.

Trees or large shrubs. *Leaves* alternate, pinnate; leaflets entire, coriaceous. *Flowers* in panicles of umbels; bracts small, lanceolate or 0; pedicels articulate under the flower. *Calyx*-limb minutely toothed. *Petals* 5–8, usually 5, free, valvate in bud.

Stamens 5–8, anthers oblong. *Ovary* 5–8-celled, the cells 1-ovuled; styles 5–8, distinct, erect. *Fruit* a 5-angled, subglobose berry with 5–8 pyrenes. *Seed* compressed, albumen uniform.

POLYSCIAS ACUMINATA, Seem.; F. B. I. ii. 727; Bedd. Fl. t. 213. *Hedera acuminata*, Wt. Ic. t. 1063.

W. Ghâts, in W. Nilgiris, Anamalais and hills of Tinnevelly at *4,500–5,000 ft.*

A glabrous tree with long pinnate leaves with many oblong-lanceolate, long-acuminate leaflets, the flower umbels in racemes in a panicle.

4. **Schefflera**, Forster.

Trees or climbing shrubs. *Leaves* alternate, digitate, rarely compound-digitate or 1-foliolate; leaflets usually coriaceous, entire or distally toothed; petioles long; stipules usually connate within the petiole. *Flowers* in panicles of umbels or compound racemes, usually terminal; bracts usually deciduous; bracteoles 0 or few, sometimes united in a tube; pedicels, if present, not jointed. *Calyx*-mouth truncate or toothed. *Petals* 5–6 or many, valvate. *Stamens* as many as the petals. *Ovary*-cells as many as the petals; styles small, separate or combined in a column. *Fruit* a subglobose, 5–6-angled dry drupe. *Seeds* compressed; albumen uniform.

Flowers pedicellate; bracteoles few or none:—
  Styles connate in a cylindric column; trees:—
    Flowers in umbels:—
      Umbels large, nearly 1 in. in diam., many-flowered, in terminal racemes of rather large flowers; bracts, bracteoles and pedicels woolly; leaflets coriaceous with conspicuous nerves impressed above, raised beneath .... 1. *rostrata.*
      Umbels small, about ·5 in. in diam., few- (about 12-) flowered, in lateral panicles of racemes and small flowers; bracts, bracteoles and pedicels glabrous; leaflets chartaceous with slender nerves scarcely impressed or raised.........2. *micrantha.*
    Flowers in racemes, in panicles up to 1 ft. long from the wood of the previous year; bracts, bracteoles and pedicels rusty-pubescent; leaflets glaucous beneath, the nerves not conspicuous .... 3. *racemosa.*
  Styles short, not connate in a cylindric column; straggling shrubs:—

Leaflets prominently reticulated :—

Leaflets large, 4 in. long or more; fruit 5-angled :—

Leaflets obovate, rounded or emarginate at apex or very slightly obtusely pointed, the main nerves oblique, petiolules slender, 1–2 in. long; umbels in racemes in a terminal panicle often 1 ft. long .... 4. *stellata.*

Leaflets ovate or elliptic, shortly and suddenly pointed at apex :—

Leaflets chartaceous, the main nerves scarcely more prominent than the secondary and the reticulations, not very oblique, about 60° with the midrib; panicles with a rather long rhachis .... 5. *Roxburghii.*

Leaflets coriaceous, the main nerves much more prominent than the secondary and the reticulations, very oblique, about 30° with the midrib; panicles with a short rhachis 6. *venulosa.*

Leaflets under 2 in. long, coriaceous, obovate, obtuse or emarginate, petiolules ·25–·5 in. long; umbels in subterminal stellate-villous racemes about 1 in. long .... 7. *Bourdillonii.*

Leaflets not prominently reticulated, oblong, acute, coriaceous, up to 10 in. long, 4 in. broad, petiole 7–15 in. long, petiolules 5–10, 2 in. long or longer; umbels in large panicles up to 12 in. long...8. *Wallichiana.*

Flowers sessile, bracteoles 4 to each flower; leaflets 6–8, oblong, acute or acuminate, up to 6 in. and even 1 ft. long, petiole about 6 in., petiolules stout, 1–2 in. long; flower-umbels in panicles of racemes with stout branches .... 9. *capitata.*

1. SCHEFFLERA ROSTRATA, Harms. *Heptapleurum rostratum*, Bedd.; F. B. I. ii. 729. *Hedera rostrata*, Wt. Ic. tt. 1013, 1014.

Nilgiri Hills, in Kundahs Sholas, above 7,000 ft.

A large tree with 5–9 lanceolate, sometimes denticulate, leaflets, the petiolules about 1 in. long, the nerves conspicuous, meeting in loops near the margin.

2. SCHEFFLERA MICRANTHA, Gamble, n. comb. *H. rostratum* var. *micrantha*, C. B. Clarke in F. B. I. ii. 729.

Nilgiri Hills, along the W. scarp from Naduvatam to Sispara, about 6,000 ft.

A tree with about 6 lanceolate or oblong-lanceolate leaflets, the petiolules ·5–1 in. long, the nerves not conspicuous nor meeting in loops.

3. SCHEFFLERA RACEMOSA, Harms. *Heptapleurum racemosum*, Bedd. Fl. t. 214; F. B. I. ii. 729. *Hedera racemosa*, Wt. Ic. t. 1015.

W. Gháts, in Shola Forests of the Nilgiris, Pulneys and southwards, at 3,000–7,000 ft.

A large tree, conspicuous for its large racemose inflorescence, the leaflets oblong-lanceolate, the petiolules 1–2 in. long. Wood soft, grey.

4. SCHEFFLERA STELLATA, Harms. *Heptapleurum stellatum*, Gaertn.; F. B. I. ii. 730. *Hedera obovata*, Wt. Ic. tt. 1011, 1012.

W. Gháts, in Nilgiris and Pulneys, up to 6,000 ft.

A large straggling or climbing shrub with small flowers, the petals usually falling as an operculum.

5. SCHEFFLERA ROXBURGHII, Gamble, n. comb. *Aralia digitata*, Roxb. *Heptapleurum venulosum*, Seem.; F. B. I. ii. 729 *in part.*

N. Circars, in Ganjam and Vizagapatam, in the E. Ghát forests.

A large straggling or climbing shrub with long racemes.

6. SCHEFFLERA VENULOSA, Harms. *Heptapleurum venulosum*, Seem.; F. B. I. ii. 729 *in part. Paratropia venulosa*, W. & A. 377; Wt. Ill. t. 118.

Deccan, in hilly country as at Horsleykonda, Chittoor; W. Gháts, on the east slopes; frequent on trees near villages.

A large straggling or climbing shrub, with coriaceous shining leaves, sometimes epiphytic. Bark grey, shining. Vern. *Hind.* Dain.

Var. *obliquinervia*, Gamble. Leaves more coriaceous, the lower 1 or 2 pairs of nerves rib-like and curving very obliquely nearly to the top; flower racemes less congested.

W. Gháts, in Wynaad, Malabar and Anamalais up to 3,000 ft.

7. SCHEFFLERA BOURDILLONII, Gamble in Kew Bull. 1919, 228.

Hills of Travancore, in evergreen forests at about 4,000 ft. (Bourdillon).

An epiphytic shrub about 12 ft. high, growing on large trees.

8. SCHEFFLERA WALLICHIANA, Harms. *Heptapleurum Wal-*

lichianum, C. B. Clarke; F. B. I. ii. 730. *Paratropia Wallichiana*, W. & A. 377.

W. Gháts, in Coorg, Nilgiris, Pulneys and hills of Tinnevèlly and Travancore up to 6,000 ft.

Apparently a climbing shrub or "somewhat arboreous" (W. & A.), or "a medium-sized tree" (Bourdillon), with large coriaceous leaflets, the main nerves nearly horizontal, the flowers 6-merous.

9. SCHEFFLERA CAPITATA, Harms. *Brassaia capitata*. C. B. Clarke; F. B. I. ii. 732. *Paratropia capitata*, W. & A. 378.

W. Gháts, in Nilgiris and Wynaad, at 3,000–6,000 ft.

A striking tree with large coriaceous digitate leaves and stout flowers, inflorescence, the flowers normally 5- often more -merous.

Nothopanax fruticosum, Miq., is an erect shrub with much cut leaves, frequently grown in gardens as a foliage plant.

Family LXXX. ALANGIACEAE.

Trees or shrubs, armed or not. *Leaves* alternate, petiolate, entire or lobed, usually unequal at base, penninerved or palmately nerved from the base; stipules 0. *Flowers* white or yellowish-white, hermaphrodite, in axillary fascicles, cymes or corymbs; pedicels articulate with the ovary; bracts 0 or small and deciduous. *Calyx*-tube adnate to the ovary, limb truncate or 4–10-toothed. *Petals* 4–10 linear, valvate, thickened, recurved in flower. *Stamens* as many as the petals and alternate with them, or 2–4 times more; filaments free or slightly connate at base where usually villous; anthers elongate, linear. *Ovary* inferior, turbinate, 1–2-celled, surmounted by a disk enclosing the elongate style; stigma large, capitate; ovules solitary in the cells, pendulous. *Fruit* a 1–2-seeded berry, crowned by the calyx-lobes and disk; testa thick; albumen fleshy; cotyledons leafy, flattened, cordate at base; radicle long, terete.

Alangium, Lamk.

CHARACTERS OF THE FAMILY.

Flowers fascicled; stamens 2–4 times as many as the petals; buds about ·75 in. long, tawny-pubescent; leaves oblong- or elliptic-lanceolate, more or less 3–5-nerved at the base, berry ellipsoid, pubescent, ·75 in. long..1. *salvifolium*.

Flowers in cymes; stamens as many as the petals; buds slender, about ·5 in. long, nearly glabrous; leaves ovate, broad, entire or lobed with acuminate lobes, palmately 3–5-nerved at the base; berry ovoid; glabrous, ·25 in. long..................................2. *begonifolium.*

1. ALANGIUM SALVIFOLIUM, Wang. *A. Lamarckii*, Thw.; F. B. I. ii. 741; Bedd. Fl. t. 215. *A. decapetalum*, Lamk.; W. & A. 325.

Circars, Deccan and Carnatic, in dry regions, in the plains and low hills, common on roadsides.

A deciduous small tree, sometimes straggling, sometimes spinous, with pretty white-scented flowers. Bark grey, orange-yellow when young; wood olive-brown, hard and close-grained, scented, useful for ornamental work and a good fuel. Vern. *Hind.* Akola; *Ur.* Ankula; *Tel.* Ankolamu; *Tam.* Alangi; *Mal.* Arinjil; *Kan.* Ankola.

Var. *hexapetalum*, Wang. *A. hexapetalum*, Lamk.; W. & A. 326. Leaves thinner, 3–5-nerved at base, cuspidate-acuminate at apex; berry larger; apparently evergreen and usually climbing.

W. Coast, in Malabar and Travancore.

2. ALANGIUM BEGONIFOLIUM, Baill. *Marlea begonifolia*, Roxb. Cor. Pl. t. 283; F. B. I. ii. 743.

E. Ghâts, Madgol Hills of Vizagapatam above 3,000 ft. (A. W. Lushington).

A small tree with white flowers and broad lobed leaves. Bark grey; wood white and soft.

Family LXXXI. CORNACEAE.

Trees or shrubs, rarely herbs. *Leaves* opposite or alternate, petiolate, entire or angular-lobed or serrate; stipules usually 0. *Flowers* small, hermaphrodite or unisexual, in dichotomously branched panicles cymes or heads, white or yellow or sometimes green or lurid. *Calyx*-tube adnate to the ovary; limb 4–5-lobed or subtruncate. *Petals* 4–5, rarely 0, alternate with the calyx-lobes, imbricate or valvate. *Stamens* as many as and alternate with the petals; filaments short; anthers introrse. *Disk* epigynous, usually fleshy. *Ovary* inferior, 1–4-celled; ovules solitary in the cells, pendulous; style simple or sometimes divided. *Fruit* a drupe or berry, 1–4-celled, with 1–4 bony or crustaceous pyrenes. *Seeds* oblong, terete, pendulous; testa membranous; albumen

copious enclosing the subfoliaceous cotyledons; embryo axile, radicle terete or flattened.

Mastixia, Blume.

Trees, the branches terete. *Leaves* opposite or alternate, petioled, entire. *Flowers* small, hermaphrodite, in terminal many-flowered panicles; bracts small or elongate; bracteoles 2 at the base of the calyx-tube; pedicel articulate. *Calyx*-tube campanulate, limb 4–5-lobed. *Petals* 4–5, ovate, coriaceous, valvate, the apex inflexed. *Stamens* 4–5, alternate with the petals; filaments short; anthers oblong-cordate. *Disk* fleshy, 4–5-lobed. *Ovary* 1-celled; ovule 1, pendulous near the top of the cell; style short, cylindric. *Fruit* an ovoid or ellipsoid drupe, crowned by the scar of the calyx-lobes; putamen woody, grooved down one side. *Seed* ellipsoid; testa membranous; albumen fleshy; cotyledons foliaceous; radicle elongate.

Bracts hardly any; bracteoles small, linear lanceolate; leaves elliptic, suddenly narrowed in a twisted acumen, glabrous, drying black or bluish, paler beneath; inflorescence stout, subglabrous or sparsely puberulous; flower buds ·1 in. in diam.; drupe 1 in. by ·75 in. ....1. *arborea.*

Bracts leafy, up to ·75 in. long; leaf-acumen not or slightly twisted; flower-buds about ·05 in. in diam.:—

Bracteoles conspicuous, linear; leaves elliptic, glabrous, drying grey, almost glaucous beneath; inflorescence slender and spreading, tawny-villous; drupe not known ....2. *Meziana.*

Bracteoles small, lanceolate-acuminate; leaves elliptic-oblong, glabrous or puberulous when young, drying olive-green, pale beneath; inflorescence slender but close, densely white-villous; drupe oblong, 1·25 by ·5 in.......................................3. *pentandra.*

1. Mastixia arborea, C. B. Clarke; F. B. I. ii. 745; Bedd. Fl. t. 216. *Bursinopetalum arboreum*, Wt. Ic. t. 956.

W. Ghâts, from S. Canara southwards, in evergreen forests from 3,000 ft. upwards.

A large tree with coriaceous leaves and a large greenish-purple drupe. Bark pale brown, lenticellate; wood greyish-yellow, soft.

2. Mastixia Meziana, Wangerin in Fedde Rep. iv. 336.

W. Coast, in Malabar and northwards (*teste* Wangerin).

A tree with conspicuously bracteate inflorescence.

3. MASTIXIA PENTANDRA, Bl.; F. B. I. ii. 746.
W. Coast and W. Ghâts, in Canara and Malabar to Travancore, in evergreen forests and on river banks up to 1,000 ft. A very large tree (Bourdillon) with elliptic-oblong leaves up to 6 in. long, 2·5 in. broad. Wood greyish-white, soft.

III. COROLLIFLORAE.

Sepals herbaceous, often connate in a usually persistent calyx, more or less adnate to the ovary or free. *Petals* usually as many as the sepals or sometimes fewer, usually 4–5, rarely 6 or more, very rarely biseriate, almost always combined in a corolla. *Stamens* 1-seriate, as many as the petals or fewer, sometimes biseriate and twice as many as the petals, sometimes but more rarely indefinite; filaments usually adnate to the corolla-tube, rarely free. *Carpels* usually connate, the styles free, sometimes free and then the styles united.

Family LXXXII. CAPRIFOLIACEAE.

Small trees or shrubs, erect or climbing. *Leaves* opposite, rarely alternate, simple lobed or imparipinnate; stipules usually 0. *Flowers* hermaphrodite, regular or irregular, in cymes or panicles. *Calyx* adnate to the ovary; lobes 3–5, imbricate. *Petals* connate in a tubular, funnel-shaped or rotate corolla, 5-fid, with imbricate lobes. *Stamens* 5, rarely 4, inserted on the corolla-tube alternately with the lobes; filaments filiform or subulate; anthers 2-celled, introrse, dehiscing longitudinally. *Ovary* inferior, 2–8-, rarely 1-celled; style terminal; stigma capitate, or short with 2–5 lobes; ovules solitary, pendulous, or several on axile placentas. *Fruit* a drupe with 1–8 cartilaginous pyrenes or a many-seeded berry. *Seeds* 1 or many in each cell; albumen copious, fleshy; embryo usually minute with ovate cotyledons.

Corolla-limb regular, flowers small; ovary cells 1-ovuled; stigma lobed..1. **Viburnum.**
Corolla-limb regular or irregular, flowers rather large; ovary cells many-ovuled; stigma capitate..............................2. **Lonicera.**

1. Viburnum, Linn.

Trees or shrubs. *Leaves* opposite, petioled, simple or lobed, entire dentate or serrate; stipules inconspicuous or 0. *Flowers*

in terminal or subterminal umbels, corymbs or thyrsoid panicles, white greenish or pink; bracts and bracteoles usually deciduous. *Calyx*-tube turbinate or cylindric; lobes 5, short, persistent. *Corolla* rotate, tubular or campanulate, lobes 5. *Stamens* 5, inserted on the corolla-tube. *Ovary* 1–3-celled; ovules 1 in each cell, pendulous; style short; stigma 3-lobed. *Fruit* a dry or fleshy drupe, usually 1-seeded; endocarp crustaceous, ridged and furrowed or excavated on one side. *Seed* compressed; albumen uniform or ruminate; embryo minute with small cotyledons and cylindric superior radicle.

Flowers in erect compound umbels:—

Corolla rotate, the lobes ovate, spreading, bracts persistent; leaves elliptic, acuminate, entire, the margins recurved, up to 5 in. long, 2 in. broad, covered beneath, like the branchlets and inflorescence, with round peltate scales; drupe oblong, flattened, punctate 1. *acuminatum.*

Corolla tubular, the lobes short, erect; drupe glabrous; no peltate scales but tufts of hair in the axils of the leaf-nerves beneath:—

Corolla glabrous; bracteoles deciduous; drupe ellipsoid; leaves ovate-lanceolate, long-acuminate, entire or slightly serrate with about 4–6 pairs of nerves the lower only subopposite. 2. *coriaceum.*

Corolla pubescent; bracteoles linear, persistent; drupe ovoid; leaves ovate, acute, distantly slightly dentate with about 4 pairs of nerves, the 2 lower prominent, opposite or subopposite from near the base.. 3. *hebanthum.*

Flowers in drooping panicles; corolla cylindric, the lobes hypocrateriform, spreading; no peltate scales, but the inflorescence, nerve-axils and petioles villous; leaves ovate, acute, serrate, with about 4–6 pairs of prominent, subopposite or alternate nerves; drupe ovoid-oblong, the endocarp with a T-shaped ventral groove ... 4. *erubescens.*

1. Viburnum acuminatum, Wall.; W. & A. 388; Wt. Ic. t. 1021. *V. punctatum*, Ham., var. *acuminatum*, C. B. Clarke in F. B. I. iii. 5; Bedd. Fl. t. 217.

N. Circars, Mahendragiri Hill at 4,000 ft.; Deccan, in Mysore and the hills of N. Coimbatore; W. Ghâts, from Mysore to Travancore, in evergreen forests at 3,000 to 6,000 ft.

A small evergreen tree with white flowers. Bark thin,

brown, tessellated; wood light red, hard and close-grained. Vern. *Tam.* Konakaran; *Badaga*, Yellé sundé.

2. VIBURNUM CORIACEUM, Bl.; F. B. I. iii. 6. *V. capitellatum*, W. & A. 388. *V. hebanthum*; Wt. Ic. t. 1023, *letterpress* 1022 (?).

Deccan, hills of N. Coimbatore; W. Gháts, about Coonoor in Nilgiris at 6,000 ft., sometimes higher, more common in Pulneys, on the margins of Sholas.

A small evergreen tree with whitish flowers.

3. VIBURNUM HEBANTHUM, W. & A. 388; F. B. I. iii. 6. *V. capitellatum*, Wt. Ic. t. 1022, *letterpress* 1023 (?).

W. Gháts, in Nilgiri Shola Forests at 6,000–8,000 ft., common about Ootacamund.

A small tree with bright green foliage and a strong, heavy, unpleasant smell, the flowers greenish-white. Bark brown, thin, lenticellate; wood light reddish-brown. Vern. *Badaga*, Kadambu.

4. VIBURNUM ERUBESCENS, Wall.; F. B. I. iii. 7. *V. Wightianum*, W. & A. 388; Wt. Ic. t. 1024.

W. Gháts, in the higher Sholas of Nilgiris at and above 7,000 ft., common, less so in the Pulney Hills.

A small tree with drooping thyrsi of white or pinkish flowers on red stalks, the fruit red. Bark thin, grey; wood soft, reddish.

2. **Lonicera,** Linn.

Erect or climbing shrubs. *Leaves* opposite, petioled sessile or sometimes connate, entire or sometimes sinuate; stipules 0. *Flowers* of various sizes, usually in peduncled pairs, axillary and solitary or in subterminal heads panicles or clusters; bracteoles 2. *Calyx*-tube ovoid or globose; limb short, 5-toothed. *Corolla* tubular campanulate or funnel-shaped, often irregular; limb 5-cleft. *Stamens* 5, inserted on the corolla-tube. *Ovary* 2–3-celled; ovules several in each cell in double rows on axile placentas; style slender; stigma capitate. *Fruit* a fleshy 2–3-celled berry; the berries in pairs or sometimes more or less united. *Seeds* few in each cell; testa crustaceous; albumen fleshy; embryo terete.

Climbing shrub; corolla-tube much elongate, 2-lipped; leaves ovate, acuminate, densely grey-tomentose beneath, up to 3 in. long; berries distinct...1. *Leschenaultii.*

Erect shrub; corolla-tube shortly elongate and gibbous at base, 5-lobed; leaves lanceolate, nearly glabrous beneath, up to 2 in. long; berries combined, the pair enclosed in a membranous bract, the calyx-limb with a reflexed ring below the lobes... ....2. *ligustrina.*

1. LONICERA LESCHENAULTII, Wall.; F. B. I. iii. 10; W. & A. 389; Wt. Ill. tt. 120 and 121 B.
   Hills of the Deccan, Carnatic and W. Gháts above 5,000 ft.
   A climbing shrub with light brown papery bark and creamy-white flowers.
2. LONICERA LIGUSTRINA, Wall.; F. B. I. iii. 12; W. & A. 389; Wt. Ic. t. 1025.
   W. Gháts, in the Nilgiris and Pulneys above 6,000 ft.
   An erect shrub with twisted stems, light brown papery bark, small leaves and creamy-white flowers, sometimes used as a hedge-plant.